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ABSTPACT

The purpose of the study contained in this report is to provide research and design data for the Southwest Regional Laboratory (SWRL) Mod 2 Reading Program, a four-year program (K-3) for teaching reading skills to primary-grade children. The report is divided into two volumes. Volume one describes sequencing and methodology, and the specific rule sequences developed for the Mod 2 Reading Program; volume two lists all words (including irregularly spelled words and proper names) sequenced by and within the rules. The design of the program is based on the premise that pupil knowledge of the phoneme grapheme correspondences of English orthography and pupil ability to apply these correspondences are essential. A set of correspondence rules was developed from a 9000-word lexicon to systematically organize instruction for beginning reading. With the aid of computer sorting procedures, rules and rule exemplars were sequenced according to criteria of productivity, regularity, generalizability, and phonological equivalence. (Author/RB)

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DESIGN FOR SEQUENCING SPELLING-TO-SOUND CORRESPONDENCES IN MOD 2 READING PROGRAM

Betty Berdiansky, George Stanton, and Bruce Cronnell

ABSTRACT

From a 9000-word lexicon, a set of spelling-to-sound correspondence rules was developed to systematically organize instruction for beginning reading. With the aid of computer sorting procedures, rules and rule exemplars were sequenced according to criteria of productivity, regularity, generalizability, and phonological equivalence.

This report is in two volumes: Volume I describes sequencing criteria and methodology, and the specific rule sequence; Volume II lists all words (including irregularly-spelled words and proper nouns), sequenced by and within rules.

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DESIGN FOR SEQUENCING SPELLING-TO-SOUND CORRESPONDENCES IN MOD 2 READING PROGRAM--VOLUME II

Introduction

The design of the reading component of the Southwest Regional Laboratory's Communication Skills program is based on the premise that pupil knowledge of the spelling-to-sound correspondences of English orthography and ability to apply these correspondences is essential for success in reading words not previously introduced in instruction. To meet the design requirements implied, it was necessary to specify the spelling-to-sound correspondences for an age-graded lexicon appropriate to beginning readers, and to organize them for use in beginning reading instruction.

The spelling-to-sound correspondences were specified in Berdiansky, Cronnell, and Koehler (1965) and further elaborated in Cronnell (1971) and in the present report (see especially Volume I, Section II). These correspondences were applied to an age-graded lexicon-appropriate to beginning readers (Berdiansky et al., 1969).

Criteria for organizing and sequencing these correspondences for instruction were proposed by Desberg and Cronnell (1969). The proposals were limited in that primary vowels, secondary vowels and consonants were sequenced separately and in that the sequence was not applied directly to the lexicon. The activity reported here resulted in a design for a combined sequence of correspondences for primary vowels, secondary vowels, and consonants, applied to the Berdiansky et al. (1969) lexicon.

Volume I of this report describes the criteria and methods used in designing the sequence of correspondence rules (see especially Section I). This rule sequence is described in detail in Volume I, Section II, and is summarized in Appendix C.

After the rule sequence was established, the words in the Berdiansky et al. (1969) lexicon were arranged in the sequence, such that each word was introduced as an exemplar of only one correspondence, all other

For their assistance in the preparation of this volume we wish to thank the Product Design secretarial staff, particularly Gloria Wellman, who typed (and retyped) these word lists. Richard Anguilly of Product Integration prepared and executed the sequencing of words by computer for Section II.

The sequence also contains affixes, compounds, and stress patterns. For convenience, however, it is simply referred to as the rule sequence.

correspondences in the word having been previously introduced. This arrangement of words according to the rule sequence was done by hand and by computer, and is described in greater detail in Volume 1, Section II.

The exemplar words for each rule (or affix, compound or stress pattern) were also sequenced for predicted ease of presentation and learning of the specific rule. The criteria for this within-rule sequencing are presented in Section I of this volume. Section II contains the actual words sequenced by rule and within rules; this establishes the design for beginning reading instruction.

Section III contains those words from the Berdiansky et al. (1969) lexicon which could not be sequenced because of irregular spelling-to-sound correspondences. Proper names from Cronnell (1969a) are sequenced in Section IV according to the rule sequence. Other words from the Berdiansky et al. (1969) lexicon which were not provided for in the rule sequence are found in Section V.

Some time after this report was completed, a careful check was made of the Berdiansky et al. (1969) lexicon to determine whether all words had been sequenced. Some errors and a number of omissions were discovered. Rather than making changes in the word lists, these words are listed in the present report as Errata and Addenda.

Appendices include a key to pronunciation and symbols, a glossary, a summary of the rule sequence, and a table listing word frequencies by year and by section of the present volume.

Section I

Criteria for Within-Rule Sequencing

The general criteria for within-rule sequencing is described in Volume I, Section I of this report. The present section details the specific criteria used in the word lists in Volume II, Section II, 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 rank 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 geminate 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 ee,
 - c. exemplars containing long vowels,
 - d. exemplars containing secondary vowels;
- 6) The pronunciation of the vowel(s) in an exemplar will be somewhat affected by the consonant it precedes if that consonant is r, l, or a nasal (n, m, ng).

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 four-year sequence: "general position criteria," "special position criteria," and "R criteria."

General position criteria

The "general position criteria" are given below, with the underlined 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 = <u>C</u> VC | 2b = C <u>V</u> C | 3b = <u>CC</u> VC | 4b = <u>(C)</u> VCC | 5b = <u>(C)</u> VCC |
| | | | 4c = <u>CCVCC</u> | 5c = <u>CCVCC</u> |
| | | | 4d = <u>CCVCC</u> | 5d = <u>CCVCC</u> |
| | | | | 5e = CCCV.. or ..VCCC |

Vowels (one-syllable words):

- | | | | | |
|-----------------|-------------------|------------------|-------------------|-----------------------|
| 1a = V | 2a = CV | 3a = VCC | 4a = CVCC | 5a = CCVCC |
| 1b = <u>V</u> C | 2b = C <u>V</u> C | 3b = <u>CC</u> V | 4b = <u>CCV</u> C | 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 = grapheme unit medial

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

For explanation of the symbols and terms used in this report, see Appendices A and B.

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-Pule Sequencing of First- and Second-Year Word Lists

| | | |
|------------|----------------------|--|
| Blocks 1-4 | | general position criteria |
| Block 5 | | |
| 5,1 | | alphabetical |
| 5,5 | | general position criteria |
| Block 6 | | general position criteria, with final silent <u>e</u> excluded (e.g., <u>name</u> = CVC); R criteria |
| Block 7 | | |
| 7,1 | | general position criteria, with final silent <u>e</u> excluded (e.g., <u>face</u> = 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 = / <u> </u> 2 = other |
| | 016 | 1 = /# <u> </u> 2 = <u>con</u> - 3 = other |

In 1,1, these criteria were modified because of the introduction of five rules at once:

- 1 = VC
- 2 = CVC
- 3 = (C)VCC

Block 9

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

9,2 E21

1 = base + er
 a = $\begin{matrix} C \\ VC \end{matrix} \underline{er}$
 b = C + er

2 = unstressed final er
 a = $\begin{matrix} VC \\ C: C \end{matrix} \underline{er}$
 b = C C, er

3 = er
 4 = secondary stressed er(C):

U21, 121, 21
 1 = compounds
 2 = other

021
 1 = compounds
 2 = er
 3 = other

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

Block 10

10,1 117

1 = ish
 2 = iC
 3 = CC

017
 1 = us
 2 = other

E17

1 = base + ness/less
 a = -ness
 b = -less

2 = base + en/ed
 a = -en
 b = -ed

3 = other words with ess, en, ed

The notation C C indicates two different consonant letters, while C C indicates two occurrences of the same letter.

- 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 = arC

- 017
- 1 = on
 - 2 = other (not / r)
 - 3 = or(C)

- 10,2 Y17
- 1 = base + ly
 - 2 = base + y
 - a = $\frac{CC}{VC} + y$
 - b = C + Cy
 - 3 = numbers
 - 4 = other
 - a = $C_1 C_1 y$
 - b = $\left\{ \begin{matrix} VC \\ C_1 C \end{matrix} \right\} y$

- LE22
- 1 = $C_1 C_1 \frac{le}{e}$
 - 2 = $\left\{ \begin{matrix} VC \\ C_1 C \end{matrix} \right\} \frac{le}{e}$

10,3 alphabetical

- 10,4 116
- 1 = in-
 - 2 = dis-
 - 3 = other

- U16
- 1 = un + base
 - 2 = other

A16, 016, E21, 021, EE10

alphabetical

- 10,5 A17 1 = a + basé
2 = a
3 = other
- E17 1 = ex-
2 = e
3 = other
- G17 1 = con-
2 = com- and col-
3 = pro-
4 = other (not / r)
5 = -Cor
- G17, 117 alphabetical

Block 11

- 11,1 1 = base + ing
2 = -ing#
3 = other
- 11,2 general position criteria
- 11,3 general position criteria
- 11,4 general position criteria
- 11,5 G610 1 = one-syllable words; compounds
2 = other two-syllable words
- G610 alphabetical
- 11,6 1 = one-syllable words
2 = nger#
3 = other two-syllable words

Block 12

- 12,1 general position criteria

- 12,2 EA11
- 1 = environments applying to EA11, but not to EA31
 - a = / ___ #
 - b = / ___ l
 - c = / ___ m
 - d = / ___ ch
 - e = / ___ p
 - t = 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 (environments 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 = / ___ i
 - b = / ___ n

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 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.

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

031 1 = one-syllable words
 2 = base + ful
 3 = other two-syllable words

13,2 A23 1 = / ll
 2 = / lt
 3 = / ld
 plus special position criteria

023 1 = / ll
 2 = / ld
 3 = / lt
 plus special position criteria

13,3 122 1 = / nd
 2 = / ld
 plus special position criteria

024'

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

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#

Criteria for within file sequencing of 1st-Year Words List

Block 15

- 15,1 alphabetical
- 15,2 general position criteria

Block 16

- 16,1 general position criteria; R criteria
- 16,2 general position criteria; R criteria
- 16,3 UE10
 - 1 = one-syllable words
 - 2 = two-syllable words
- 0A10 general position criteria; R criteria
- 16,4 general position criteria
- 16,5 general position criteria
- 16,6 UE10 general position criteria
- UE10
 - 1 = one-syllable words
 - 2 = compounds
 - 3 = two-syllable words
- EW10 general position criteria

Block 17

- 17,1 alphabetical
- 17,2 -er
 - 1 = V11, C2 + er
 - 2 = other VC2 + er
 - 3 = 12 (LE22) + er
 - 4 = y |av| + 1 + 2 + er
- en alphabetical
- ing
 - 1 = V11, C2 + ing
 - 2 = other
- y
 - 1 = V11, C2 + y
 - 2 = other

- 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 = [əd]
- 2 = CVed
- 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 = ~~e~~
- 2 = compounds
- a = no change in base word
- b = ~~e~~

-en, -ing,
-ed

alphabetical

-ly

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

Block 18

18,1

E13

- 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
- 113 1 = i-
 2 = ci-
 3 = cci-
 4 = three-syllable words
- U13 1 = (C)u-
 2 = cu-
 3 = three-syllable words
 plus R criteria
- 18,2 S20 general position criteria; final silent e
 excluded (e.g., nose = CVC)
- 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 + 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 |
| | 124 + GH10 | general position criteria, with <u>gh</u> as part of the vowel (i.e., <u>igh</u> = V) |
| | GH10 | 1 = <u>gh</u> # 2 = <u>ght</u> # 3 = two- and three-syllable words |
| | H20 | 1 = <u>h</u> → ∅ / # 2 = <u>h</u> → ∅ / # 3 = <u>h</u> → ∅ / <u>V</u> unstressed |
| 19,3 | K20 | general position criteria, with <u>kn</u> as a consonant (e.g., <u>knit</u> = CVC) |
| | G20 | 1 = # <u>gn</u> 2 = <u>gn</u> # a = <u>ign</u> (Rule 122) b = other |
| | W20 | general position criteria, with <u>wr</u> as a consonant (e.g., <u>wring</u> = CVC) |
| 19,4 | | general position criteria, with <u>mb</u> as a consonant (e.g., <u>lamb</u> = CVC) |
| 19,5 | L20 | 1 = - <u>alk</u> (Rule A23) a = one-syllable words b = two-syllable words 2 = - <u>olk</u> (Rule 023) 3 = - <u>aif</u> 4 = - <u>alv</u> 5 = - <u>alm</u> |
| | T20 | 1 = - <u>stle</u> 2 = - <u>sten</u> 3 = - <u>ften</u> |
| 19,6 | | 1 = one-syllable words 2 = two-syllable words |
| Block 20 | | |
| 20,1 | -γ | 1 = no change in base 2 = ∅ 3 = other |

- ful alphabetical
- al 1 = no change in base
2 = ~~e~~
- able 1 = no change in base
2 = ~~e~~ (optional)
- eth, -less, alphabetical
- ist, -ish

- 20,2 general position criteria
- 20,3 1 = -ther
a = two-syllable words
b = three-syllable words
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 = ~~e~~ + ion
4 = base + ation
a = no change in base
b = ~~e~~
5 = miscellaneous changes in base
6 = tion + al
7 = tion → [Con]/s

- 21,3 -sion → [ʒʊn]
- 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 → [ʃən]

- 1 = /V__
- 2 = /r__
- 3 = de + ion → sion
- a = V → [V̥] / __{desion}
- b = V → [V̥] / de
→ [V̥] / __sion

21,4

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

Block 22

22,1

- 1 = V11,Ce#
 - a = first vowel: vowel 16 rule
 - b = first vowel: other vowel rule
- 2 = Y19#
- 3 = V15,C(C)(e)#
- 4 = other

22,2

- 1 = Y17#
- 2 = LE22#
- 3 = V17,l#
- 4 = V17,r# or E21,r#
- 5 = A17#
- 6 = V17,C#
- 7 = V17,CC#
- 8 = V17,C(C)e#

22,3

- 1 = A17#
- 2 = V17,r# or E21,r#
- 3 = O25#
- 4 = V17,C(C)#
- 5 = V17,l# or LE22#
- 6 = other

22,4

- 1 = EE10,(C)#
- 2 = other

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...
- 23,2 135 1 = / #
a = one-syllable words
b = two- and three-syllable words
2 = -ine#
3 = other
- 125 1 = -ion
2 = -ior
3 = -ia
4 = view
5 = other
- 23,3 alphabetical

Block 24

- 24,1 four-syllable compounds,
-ing, -y, -er, -or, -en, -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 = / C ic
 a = two-syllable words (plus affixes)
 b = three- and four-syllable words
- 2 = / C it
 a = two-syllable words (plus affixes)
 b = three-syllable words
- 3 = / C ish
- 4 = / C id

24,4

- 1 = base + ity
- 2 = e
- 3 = other

Block 25

25,1

- 1 = base + ion
 a = no change in base
 b = e
- 2 = -ation
 a = no change in base
 b = e
- 3 = e + ition [i'sən]
- 4 = miscellaneous changes
- 5 = first vowel: [V] in base → [V̄] in affixed form (with various changes)
- 6 = other

25,2

126

- 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

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

A26, 026

alphabetical

25,3

136

- 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 = ~~e~~
 4 = y → i (ay)

-ment alphabetical

-al 1 = no palatalizations
 2 = palatalizations

-ness, -ary, -ist
 alphabetical

26,2 IE17 1 = base + ie
 2 = other

EY17 1 = base + ey
 2 = other two-syllable words
 3 = three- and four-syllable words

26,3 alphabetical

26,4 general position criteria, with r as part of V (i.e., ear = V)

26,5 general position criteria

26,6 EY10 general position criteria

E120 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 → i + ous
5 = non-base
6 = -ous + suffix

0031 general position criteria

0035 general position criteria; R criteria

0033 general position criteria; R criteria

0034 general position criteria, with gh as part of V (i.e., ough = V)

26,6 general position criteria

Block 27

27,1 in-
1 = -ed
2 = other

in-, ms-, is-

alphabetical

27,2 Stress pattern 4A

1 = ia(C)(e)
a = ia
b = ial-
c = other
2 = e ua
3 = Vr(y)
a = ior
b = Vr-
c = Vry-
4 = Y17
5 = -ence/-ent
6 = Vole
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

E77

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

032

1 = three-syllables → two-syllables
a = -ory
b = other
2 = four-syllables → three-syllables
3 = five-syllables → four-syllables

A32, 152

1 = three-syllables → two-syllables
2 = four-syllables → three-syllables

Section II

Sequenced Word Lists

First-Year Word List

Frequency = .796

Block 1 Frequency = 315

1,1 Frequency = 10

N10, NN10, T10, A15, I15 Frequency = 10

| | | | | | |
|----------|-----|------|-----|-----|----|
| <u>1</u> | an | at | in | inn | it |
| <u>2</u> | tan | tat | tin | | |
| <u>3</u> | ant | tint | | | |

1,2 Frequency = 11

P10 Frequency = 11

| | | | | | |
|-----------|------|-----|-----|-----|-----|
| <u>1b</u> | pan | pat | pin | pip | pit |
| <u>2b</u> | nap | nip | tap | tip | |
| <u>3a</u> | pant | | | | |
| <u>5b</u> | apt | | | | |

1,3 Frequency = 40

L10 Frequency = 7

| | | | | |
|-----------|-------|-----|-----|--|
| <u>1b</u> | lap | lip | lit | |
| <u>2b</u> | pal | | | |
| <u>3a</u> | lint | | | |
| <u>5a</u> | p'an | | | |
| <u>5c</u> | plant | | | |

LL10 Frequency = 3

| | | | |
|-----------|------|------|--|
| <u>2a</u> | ill | | |
| <u>2b</u> | nill | till | |

1,3 (con't) S10 Frequency = 27

| | | | | | |
|-----------|-------|-------|------|-------|------|
| <u>1b</u> | sap | sat | sill | sin | sip |
| | sit | | | | |
| <u>4a</u> | slap | slat | slip | slit | snap |
| | snip | span | spat | spill | spin |
| | spit | still | | | |
| <u>4b</u> | its | taps | | | |
| <u>4c</u> | slant | | | | |
| <u>5b</u> | last | lisp | list | past | |
| <u>5e</u> | pants | split | | | |

SS10 - Frequency = 3

| | | |
|-----------|------|------|
| <u>2a</u> | ass | |
| <u>2b</u> | lass | pass |

1,4 Frequency = 47

D10 Frequency = 14

| | | | | | |
|-----------|-------|------|------|-----|-----|
| <u>1b</u> | dad | did | dill | din | dip |
| <u>2b</u> | lad | lid | pad | sad | |
| <u>3b</u> | slid | | | | |
| <u>4b</u> | and | land | sand | | |
| <u>4c</u> | stand | | | | |

DD10 Frequency = 1

| | |
|-----------|-----|
| <u>2b</u> | add |
|-----------|-----|

1,4 (con't) E15 Frequency = 32

| | | | | | |
|-----------|-------|-------|-------|------|------|
| <u>2b</u> | dell | den | led | less | let |
| | net | pen | pep | pet | sell |
| | set | tell | ten | | |
| <u>3a</u> | end | | | | |
| <u>4a</u> | dent | lend | nest | pelt | pent |
| | pest | send | sent | tend | tent |
| | test | | | | |
| <u>4b</u> | sled | sped | spell | step | |
| <u>5a</u> | slept | spend | spent | | |

1,5 Frequency = 101

M10 Frequency = 32

| | | | | | |
|-----------|---------|------|------|------|------|
| <u>1b</u> | mad | man | map | mass | mat |
| | men | mess | met | mill | miss |
| | mitt | | | | |
| <u>2a</u> | am | | | | |
| <u>2b</u> | dam | dim | tam | | |
| <u>3a</u> | mast | melt | mend | mist | |
| <u>3b</u> | slam | slim | stem | | |
| <u>4b</u> | elm | | | | |
| <u>5a</u> | smell | | | | |
| <u>5b</u> | damp | imp | lamp | limp | |
| <u>5c</u> | smelt | | | | |
| <u>5d</u> | stamp | | | | |
| <u>5e</u> | midst | | | | |
| <u>6a</u> | tom-tom | | | | |

1,5 (con't) B10 Frequency = 28

| | | | | | |
|-----------|-------|-------|-------|-------|------|
| <u>1b</u> | bad | ban | bass | bat | bed |
| | bell | bet | bib | bid | bill |
| | bin | bit | | | |
| <u>2b</u> | dab | tab | | | |
| <u>3a</u> | band | belt | bend | bent | best |
| <u>3b</u> | slab | stab | | | |
| <u>4a</u> | blab | bled | bless | bliss | |
| <u>4c</u> | blast | blend | blimp | | |

U15 Frequency = 41

| | | | | | |
|-----------|-------|-------|-------|------|------|
| <u>1b</u> | up | us | | | |
| <u>2b</u> | bud | bum | bun | bus | but |
| | butt | dull | mud | mum | muss |
| | nut | put | pup | sub | sum |
| | sun | sup | tub | tut | |
| <u>3a</u> | ups | | | | |
| <u>4a</u> | bull | bump | bust | dump | dust |
| | lump | lust | must | pump | |
| <u>4b</u> | plum | plus | slum | spun | stuh |
| | stun | | | | |
| <u>5a</u> | plump | stump | stunt | | |
| <u>5c</u> | mumps | | | | |

1,6 Frequency = 106

R10 Frequency = 45

| | | | | | |
|-----------|---------|-------|-------|-------|-------|
| <u>1b</u> | ram | ran | rap | rat | red |
| | rib | rid | rim | rip | rub |
| | rum | run | rut | | |
| <u>3a</u> | rend | rent | rest | rump | runt |
| | rust | | | | |
| <u>5a</u> | brad | bran | brass | brat | dress |
| | drill | drip | drum | press | prim |
| | trap | trill | trim | trip | |
| <u>5c</u> | brand | primp | print | tramp | trump |
| | trust | | | | |
| <u>5e</u> | strand | strap | strip | strum | strut |
| <u>6a</u> | rat-tat | | | | |

H10 Frequency = 22

| | | | | | |
|-----------|------|------|------|------|------|
| <u>1b</u> | had | ham | hat | hell | hem |
| | hen | hid | hill | him | hip |
| | hit | hub | hull | hum | hut |
| <u>3a</u> | hand | held | help | hemp | hint |
| | hump | hunt | | | |

1,6 (con't) 015 Frequency = 39

| | | | | | |
|-----------|--------|------|------|------|----------------|
| <u>1b</u> | odd | on | | | |
| <u>2b</u> | bob | doll | dot | hop | hot |
| | lot | mob | mom | mop | nod |
| | not | pod | pop | pot | rob |
| | rod | rot | sob | sod | sop |
| | top | tot | | | |
| <u>4a</u> | bond | pond | romp | | |
| <u>4b</u> | blot | drop | plod | plot | prop |
| | slop | slot | spot | stop | trot |
| <u>5a</u> | blond | | | | |
| <u>5e</u> | prompt | | | | |

Block 2 Frequency = 50

2,1 Frequency = 28

SH10 Frequency = 28

1b sham shed shell shin ship

shot shut

2a ash

2b dash dish hash hush lash

mash mush rush sash

3a shalt

3b blush brush slush smash trash

4a shred shrill shrub

4c shrimp

5e splash

2,2 Frequency = 22

TH13 Frequency = 6

1b than that them then this

thus

TH11 Frequency = 16

1b thud thin

2b bath hath lath math path

pith

3a thump

4a thrash thresh thrill thrush

4b depth tenth

4c thrust

Block 3 Frequency = 51

3,1 Frequency = 40

EE10 Frequency = 36

1b eel

2a bee see tee thee

2b beer beet deed deep deer

heed heel meet need peel

peep peer reed reel seed

seem seen seep sheep sheet

teeth

3b three tree

4b bleed sleep sleet 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

3b dry pry sly spy sty

try

6a by-by

Block 4 Frequency = 380

4,1 Frequency = 91

F10 Frequency = 51

1a fee

1b fad fan fat fed feed

feel feet fell fib fill

fin fish fit fun fuss

2a if

2b beef

3a fast felt fifth film fist

fond

4a flap flash flat fied flee

fleet flesh flip flop fly

free fresh fret fry

4b elf self shelf

4c flint

5b left lift raft shaft shift

sift

5d draft drift thrift

FF10 Frequency = 9

2b buff huff muff puff

3b fluff sniff staff stiff stuff

4,1 (con't) W10 Frequency = 31

| | | | | | |
|-----------|---------|-------|-------|-------|-------|
| <u>1a</u> | wē | wee | | | |
| <u>1b</u> | web | wed | weed | weep | well |
| | wet | will | win | wish | wit |
| | with | | | | |
| <u>3a</u> | went | wept | west | wilt | |
| <u>5a</u> | dwel | sweep | sweet | swell | swill |
| | swim | swish | tweed | tweet | twin |
| <u>5c</u> | swept | swift | twist | | |
| <u>5e</u> | twelfth | | | | |

4,2 Frequency = 187

K10 Frequency = 37

| | | | | | |
|-----------|------|-------|------|------|------|
| <u>1b</u> | keen | keep | kid | kill | kin |
| | kiss | kit | | | |
| <u>2b</u> | leek | mEEK | peek | reek | seek |
| | week | | | | |
| <u>3a</u> | kelp | kept | | | |
| <u>4b</u> | ask | bask | desk | disk | dusk |
| | elk | husk | mask | milk | risk |
| | silk | sulk | task | tusk | |
| <u>5a</u> | skid | skill | skim | skin | skip |
| | skit | skull | sky | | |

4,2 (con't) N20 Frequency = 34

| | | | | | |
|-----------|--------|-------|-------|-------|---------|
| <u>5b</u> | bank | bunk | hunk, | ink | kink |
| | link | mink | pink | punk | rark |
| | rink | sank | sink | sunK | tank |
| | thank | think | wink | | |
| <u>5d</u> | blank | blink | brink | drank | drink |
| | drunk | frank | plank | prank | shrink |
| | shrunk | skunk | slink | spank | } stink |
| | trunk | | | | |

C12

Frequency = 59

| | | | | | |
|-----------|-------|--------|-------|--------|-------|
| <u>1b</u> | cab | cad | can | cap | cash |
| | cat | cob | cod | cop | cot |
| | cub | cud | cuff | cup | cuss |
| | cut | | | | |
| <u>3a</u> | camp | cast | | | |
| <u>4a</u> | clad | clam | clan | clap | class |
| | cliff | clip | clod | club | crab |
| | cram | crash | creed | creek | creep |
| | crib | crop | crush | cry | |
| <u>4c</u> | clamp | clasp | clump | craft | cramp |
| | crank | crept | crest | crisp | crust |
| <u>5a</u> | scab | scat | | | |
| <u>5b</u> | act | fact | | | |
| <u>5c</u> | scalp | scamp | scant | | |
| <u>5d</u> | tract | | | | |
| <u>5e</u> | scrap | screen | scrub | strict | |

4,2 (con't) CK10 Frequency = 57

| | | | | | |
|-----------|--------|-------|-------|-------|-------|
| <u>2b</u> | back | beck | buck | duck | deck |
| | dock | duck | hack | heck | kick |
| | lack | lick | lock | luck | neck |
| | nick | nack | peck | pick | rack |
| | rock | sack | shack | shock | stuck |
| | sick | sock | suck | tack | thick |
| | tick | tuck | wick | | |
| <u>3b</u> | black | block | brick | click | cluck |
| | cluck | crack | flock | frock | pluck |
| | prick | slack | slick | smack | snuck |
| | spect | stack | stick | stock | stuck |
| | track | trick | truck | | |
| <u>5e</u> | struck | | | | |

4,3 Frequency = 65

G12 Frequency = 65

| | | | | | |
|-----------|-------|------------|-------|-------|-------|
| <u>1b</u> | gag | gap | gas | gash | god |
| | got | gum | gun | | |
| <u>2b</u> | bag | beg | big | bug | dig |
| | dug | fig | hag | hug | leg |
| | lag | leg | lug | mug | nag |
| | peg | pig | pug | rag | rig |
| | rug | sag | tag | tug | wag |
| | wig | | | | |
| <u>3a</u> | gasp | gulf | gulp | | |
| <u>3b</u> | crag | drag | drug | flag | plug |
| | slag | slug | snag | stag | twig |
| <u>4a</u> | glad | glass | glee | glen | grab |
| | grass | greed | green | greet | grill |
| | grin | grip | grit | grub | gruff |
| <u>4c</u> | grand | grant | grunt | | |

4,4 Frequency = 32

J10 Frequency = 12

| | | | | | |
|-----------|------|------|------|------|-----|
| <u>1b</u> | jack | jam | jell | jet | jig |
| | job | jot | jug | | |
| <u>3a</u> | jest | jump | junk | rust | |

X10 Frequency = 14

| | | | | | |
|-----------|------|-------|-----|-----|-----|
| <u>2a</u> | ax | ox | | | |
| <u>2b</u> | box | fix | fox | mix | rex |
| | six | sox | tax | wax | |
| <u>3b</u> | flax | | | | |
| <u>5b</u> | next | sixth | | | |

Y10 Frequency = 6

| | | | | | |
|-----------|-----|-----|------|-----|-----|
| <u>1a</u> | ye | | | | |
| <u>1b</u> | yak | yap | yell | yes | yet |

4,5 Frequency = 5

V10 Frequency = 2

| | |
|-----------|------|
| <u>1b</u> | van |
| <u>3a</u> | vest |

Z10 Frequency = 2

| | |
|-----------|---------|
| <u>3a</u> | zinc |
| <u>6a</u> | zid-zad |

Z210 Frequency = 1

| | |
|-----------|------|
| <u>3b</u> | buzz |
|-----------|------|

Second-Year Word List

Frequency = 2299

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

| | | | | |
|-----------|--------|--------|--------|--------|
| <u>2b</u> | bang | ding | fang | gang |
| | hang | hung | king | iung |
| | rang | ring | rung | sang |
| | sing | sung | thing | wing |
| <u>3b</u> | bring | clang | cling | fling |
| | slang | sling | slung | sting |
| | stung | swing | swung | |
| <u>5e</u> | sprang | spring | sprung | string |
| | strung | | | |

Block 6 Frequency = 259

6,1 Frequency = 176

All Frequency = 108

| | | | | |
|-------------|-------|-------|-------|-------|
| <u>1bi</u> | ale | ape | ate | |
| <u>2bi</u> | babe | bade | bake | bale |
| | cake | came | cane | cape |
| | cave | dame | date | fade |
| | fake | fame | fate | gale |
| | game | gate | gave | hate |
| | lake | lame | lane | late |
| | made | make | maie | mane |
| | mate | name | pale | pane |
| | pave | rake | rate | rave |
| | safe | sake | sale | same |
| | sane | save | shade | shake |
| | shame | shape | shave | take |
| | tale | tame | tape | vane |
| | wade | wake | wane | wave |
| <u>2bii</u> | bare | care | dare | fare |
| | hare | mare | pare | rare |
| | share | ware | | |
| <u>4bi</u> | blade | blame | blaze | brake |
| | brave | crane | crate | crave |
| | craze | drake | drape | flake |
| | flame | frame | qlade | grade |
| | grape | grate | grave | graze |

6,1 (con't)

| | | | |
|-------------------|-------|-------|-------|
| plane | plate | scale | skate |
| slate | slave | snake | spade |
| spake | stake | stale | state |
| stave | trade | | |
| <u>4bii</u> glare | scare | snare | spare |
| stare | | | |

III Frequency = 68

| | | | |
|-----------------|-----------|------|------|
| <u>2bi</u> bike | bite | dike | dime |
| dine | dive | fife | fine |
| five | hide | hike | hive |
| kite | life | like | lime |
| line | live (Aj) | mile | mine |
| mite | nine | pile | pine |
| pipe | ride | rime | ripe |
| rite | shine | side | site |
| size | tide | tile | time |
| vine | wide | wife | wine |
| wipe | | | |

| | | | |
|------------------|------|------|------|
| <u>2bii</u> fire | hire | mire | tire |
| wire | | | |

| | | | |
|------------------|-------|--------|-------|
| <u>4bi</u> bride | crime | drive | glide |
| pride | prize | shrine | slide |
| slime | smile | snipe | spike |
| spine | spite | stile | swipe |
| tribe | twine | | |

| | | | |
|-------------------|--------|--------|--------|
| <u>5ei</u> sprite | stride | strike | stripe |
|-------------------|--------|--------|--------|

6,2 Frequency = 83

011 Frequency = 60

1bii ore

| | | | | |
|------------|------|------|------|-----------|
| <u>2bi</u> | bone | code | coke | cone |
| | dole | dome | dope | dove (Vb) |
| | hole | home | hope | joke |
| | lone | mode | mole | mope |
| | note | poke | pole | pope |
| | robe | rode | role | rope |
| | rove | sole | tone | vote |
| | woke | wove | yoke | zone |

| | | | | |
|-------------|-------|------|------|------|
| <u>2bii</u> | bore | core | fore | more |
| | shore | sore | tore | wore |

| | | | | |
|------------|-------|--------|-------|-------|
| <u>4bi</u> | broke | clove | drove | froze |
| | globe | grove | slope | smoke |
| | smote | spoke | stole | stone |
| | stove | throne | | |

| | | | | |
|-------------|-------|-------|-------|-------|
| <u>4bii</u> | score | snore | store | swore |
|-------------|-------|-------|-------|-------|

5bi stroke

6,2 (con't) U11 Frequency = 16

| | | | | |
|------------|-------------------|--------------------|-------------------|------|
| <u>2bi</u> | cube ¹ | cute ¹ | duke | dune |
| | June | more ^{2*} | rude ¹ | rule |
| | tube | tune | | |

2bii cure^{1*} pure^{2*}

4bi crude^{2*} flute² lume¹ prune^{2*}

E11 Frequency = 3

1bi eve

2bi theme

2bii 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

2a ace ice

2b dice face lace lice

 mice nice pace race

 rice

3a cent

3b brace fleece grace place

 price slice space spice

 thrice trace twice

5a scene

5e spruce

G11 Frequency = 10

1a gee

1b gem gin

2a age

2b cage huge page rage

 sage

3b stage

7,2 The -s, -d, and -ing suffixes added to words with general primary vowel Rule 11.

Block 8 Frequency = 70

8,1 Frequency = 45

Compounds with rules in Block 5-7 Frequency = 45

- | | | | | |
|----------|------------|------------|-----------|-----------|
| <u>1</u> | bathrobe | bedtime | beehive | campfire |
| | classmate | cupcake | drugstore | hillside |
| | inside | jumprope | keepsake | manhole |
| | milkshake | nickname | pancake | ragtime |
| | springtime | sunshine | tadpole | teenage |
| | upside | wishbone | | |
| <u>2</u> | farewell | firefly | fireplace | fireside |
| | grapevine | herein | homemade | homesick |
| | icebox | iceman | limeade | limestone |
| | livestock | paleface | pipeline | polcat |
| | sagebrush | smokestack | sparerib | stovepipe |
| | tapeline | | | |
| <u>3</u> | gangplank | slingshot | | |

8,2 Frequency = 25

A16 Frequency = 7

- 1 abscess accent address(N) (P) annex(N)
- 2 landscape sampan transplant(N)

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 = 10

- 1 object(N)
- 2 concrete (P) (AS) conduct(N) content(N)
- contest(N) contract(N) convent
- 3 bonfire compact(N) costume

Block 9 Frequency = 322

9,1 Frequency = 107

A21 Frequency = 40

| | | | | |
|-----------|-------|-------|-------|-------|
| <u>1b</u> | ark | arm | art | |
| <u>2a</u> | bar | car | far | jar |
| | mar | tår | | |
| <u>2b</u> | bard | bark | barn | card |
| | carp | cart | dark | darn |
| | dart | farm | hard | hark |
| | harm | harp | lard | lark |
| | mark | marsh | park | part |
| | shark | sharp | tart | yard |
| | yarn | | | |
| <u>3b</u> | scar | star | | |
| <u>4b</u> | scarf | smart | spark | start |

021 Frequency = 26

| | | | | |
|-----------|-------|-------|-------|-------|
| <u>1a</u> | or | | | |
| <u>2a</u> | for | nor | | |
| <u>2b</u> | born | cord | cork | corn |
| | ford | fork | form | fort |
| | forth | horn | lord | morn |
| | north | pork | port | short |
| | sort | thorn | torn | worn |
| <u>4b</u> | sport | stork | storm | |

9,1 (con't) U21 Frequency = 15

1b urn

2a bur fur purr

2b burn curb curd curl

furl hurt turn

3b spur

4a burnt burst

4b slurp

121 Frequency = 14

2a fir sir

2b bird birth dirt shirt

third

3b stir

4a first thirst

4b flirt skirt swirl twirl

E21 Frequency = 12

2a her per

2b berth fern germ herd

jerk pert term verb

4b clerk stern

9,2 Frequency = 192

E21 Frequency = 150 (plus agent noun and comparative adjective forms of previously introduced words)

| | | | | |
|-----------|---------|----------|----------|---------|
| <u>1a</u> | 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 | |
| <u>1b</u> | batter | blotter | clipper | cutter |
| | dipper | dropper | drummer | fibber |
| | flapper | gunner | potter | robber |
| | runner | shutter | snapper | stopper |
| | swimmer | thinner | trapper | winner |
| | zipper | | | |
| <u>2a</u> | after | amber | antler | aster |
| | blister | canter | center | cinder |
| | cluster | cracker | enter | fender |
| | filter | flicker | gander | ginger |
| | hinder | huckster | limber | lobster |
| | locker | lumber | master | member |
| | mister | monster | number | pester |
| | plaster | pucker | scamper | scatter |
| | shelter | silver | sister | slender |
| | slumber | splinter | sucker | teeter |

9,2 (con't)

| | | |
|---------------|--------|--------|
| teeter-totter | temper | tender |
| tr under | tinter | tinker |
| winter | yonder | |

2b

| | | | |
|---------|---------|---------------|---------|
| banner | better | bitter | bladder |
| blubber | butter | copper | dinner |
| flutter | fodder | gutter | hammer |
| holler | inner | ladder | latter |
| letter | litter | manner | matter |
| millar | mutter | otter | patter |
| pepper | pitter | pitter-patter | |
| platter | rubber | rudder | setter |
| shatter | skipper | slipper | spatter |
| summer | supper | tatter | teller |
| twitter | udder | upper | |

3 perfume termite

4 adverb cistern concert expert

iceberg lantern pattern transfer (N)
western

U21 Frequency = 5

1 sandbur sunburn

2 burdock murmur murder

I21 Frequency = 4

1 birdseed blackbird catbird redbird

9,2 (con't) A21 Frequency = 18

| | | | | |
|----------|----------|-----------|-----------|-----------|
| <u>1</u> | backyard | barnyard | birchbark | carfare |
| | farmyard | graveyard | hardware | skylark |
| | starfish | streetcar | stockyard | yardstick |
| <u>2</u> | barber | farmer | garter | parker |
| | partner | starter | | |

021 Frequency = 15

| | | | | |
|----------|-----------|-------------|---------------|-----------|
| <u>1</u> | cornflake | landlord | northland | popcorn |
| | sandstorm | shortcake | shortcut | shortstop |
| <u>2</u> | corner | former | order | porter |
| <u>3</u> | platform | torment (N) | transport (N) | |

9,3 Frequency = 23

A25 Frequency = 11

| | | | | |
|-----------|----------|---------|------|------|
| <u>2a</u> | war | | | |
| <u>2b</u> | ward | warm | warn | wart |
| <u>4a</u> | warmth | | | |
| <u>1b</u> | dwarf | swarm | | |
| <u>6a</u> | wardrobe | warm-up | | |
| <u>6b</u> | warmer | | | |

022 Frequency = 12

| | | | | |
|-----------|-----------|-----------|----------|----------|
| <u>2b</u> | word | work | worm | worth |
| <u>4a</u> | world | worst | | |
| <u>6a</u> | fireworks | framework | homework | silkworm |
| | workshop | | | |
| <u>6t</u> | worker | | | |

Block 10 Frequency = 575

10,1 Frequency = 213

117 Frequency = 36

1 furnish greenish publish reddish

 rubbish selfish varnish

2 anvil attic bandit derrick

 goblin hermit horrid margin

 martir napkin orbit pencil

 pilgrim public pumpkin rabbit

 splendid summit tennis tonsil

 torrid traffic turnip victim

 worship

3 artist dentist district florist

117 Frequency = 6

1 cactus campus circus fungus

2 album stirrup

10,1 (con't)E17 Frequency = 89

| | | | | |
|-----------|---|--|--|---|
| <u>1a</u> | darkness sickness | gladness | illness | sadness |
| <u>1b</u> | careless | homeless | | |
| <u>2a</u> | bitten flatten sharpen | blacken harden silken | deepen ridden sweeten | fatten rotten |
| <u>2b</u> | dotted | spotted | stranded | |
| <u>3a</u> | actress princess | harness reckless | mattress | mistress |
| <u>3b</u> | burden mitten | garden pollen | happen sudden | kitten |
| <u>3c</u> | wicked | | | |
| <u>4</u> | anklet bracelet cricket magnet packet puppet skillet trumpet | basket bucket goblet mallet pallet racket tablet velvet | blanket carpet jacket market pellet russet thicket | bonnet casket locket midget pocket scarlet ticket |
| <u>5</u> | cancel mantel tassel | funnel nickel tinsel | kennel parcel tunnel | kernel pretzel vessel |
| <u>6</u> | absent harvest perfect | current hundred problem | forest object (N) statement | garment pavement subject (N) |

10,1 (con't) A17 Frequency = 45

| | | | | |
|-----------|----------|----------|----------|---------|
| <u>1</u> | brakeman | busman | fireman | foremen |
| | freshman | hunter | workman | |
| <u>2</u> | comma | extra | larva | Santa |
| <u>3</u> | central | dental | formal | moral |
| | normal | oral | rascal | sandal |
| | signal | | | |
| <u>4</u> | bantam | canvas | errand | gallant |
| | German | infant | organ | pennant |
| | servant | | | |
| <u>5a</u> | burglar | cellar | collar | dollar |
| | grammar | nectar | poplar | vulgar |
| <u>5b</u> | backward | blizzard | custard | forward |
| | homeward | mustard | standard | upward |

017 Frequency = 37

| | | | | |
|----------|---------|----------|---------|---------|
| <u>1</u> | button | cannon | canyon | carbon |
| | carton | common | cotton | crimson |
| | gallon | lesson | mutton | pardon |
| | person | ribbon | sermon | |
| <u>2</u> | blossom | bottom | freedom | gallop |
| | hammock | hassock | mammoth | method |
| | pistol | scallop | seldom | |
| <u>3</u> | actor | arbor | armor | doctor |
| | effort | harbor | mirror | oxford |
| | parlor | stubborn | tractor | |

10,2 Frequency = 226

Y17 Frequency = 142

| | | | | |
|-----------|---------|---------|----------|---------|
| <u>1</u> | badly | barely | bravely | gladly |
| | hardly | homely | lately | likely |
| | lively | lonely | manly | nicely |
| | partly | prickly | promptly | sadly |
| | safely | shapely | shortly | sweetly |
| | swiftly | warmly | weekly | |
| <u>2a</u> | 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 | | | |
| <u>2b</u> | daddy | fatty | funny | furry |
| | mommy | muddy | puppy | skinny |
| | sunny | teddy | zippy | |
| <u>3</u> | fifty | forty | ninety | sixty |
| | thirty | twenty | | |

10,2 (con't)

4a

| | | | |
|-------|--------|--------|-------|
| belly | berry | bidly | bonny |
| buddy | bunny | ditty | dizzy |
| dummy | ferry | golly | gully |
| gunny | happy | hobby | holly |
| hurry | jiffy | jolly | kitty |
| iobby | mammy | middy | penny |
| poppy | shabby | shinny | silly |
| sorry | stubby | tabby | taffy |
| tally | toddy | worry | wuzzy |

4b

| | | | |
|--------|--------|--------|---------|
| army | brandy | candy | cranky |
| 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 | | | |

10,2 (con't) LE22 Frequency = 84

| | | | | |
|----------|----------|----------|---------|----------|
| <u>1</u> | apple | battle | bottle | bubble |
| | cattle | coddle | 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 |
| <u>2</u> | angle | ankle | beetle | buckle |
| | 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 | gumble | 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

U16 Frequency = 5

1 undress unlace unlock
2 unless until

A16 Frequency = 4

accept pastel transplant(Vb) transport (Vb)

016 Frequency = 2

stockade trombone

E21 Frequency = 4

percent perfect(Vb) perform perhaps

021 Frequency = 2

cornet torment(Vb)

EE10 Frequency = 9

indeed fifteen fifteenth nineteen
nineteenth sixteen sixteenth thirteen
thirteenth

10,5 Frequency = 88

A17 Frequency = 38

| | | | | |
|----------|---------|------------|--------------|--------|
| <u>1</u> | aback | afar | afire | alike |
| | alive | alone | apart | ashore |
| | asleep | awake | awoke | |
| <u>2</u> | abode | acute | address (Vb) | admire |
| | admit | adopt | adult | afford |
| | agree | alarm | alas | alert |
| | amaze | annex (Vb) | apply | arrest |
| | arrive | assume | attack | attend |
| | attract | | | |
| <u>3</u> | canal | lapel | manure | parade |
| | salon | salute | | |

E17 Frequency = 19

| | | | | |
|----------|---------|---------|---------|----------|
| <u>1</u> | except | excite | expect | explode |
| | explore | express | extend | |
| <u>2</u> | entire | escape | | |
| <u>3</u> | between | cement | degree | describe |
| | respect | restore | secrete | sedan |
| | select | shellac | | |

10,5 (con't) 017 Frequency = 24

1 condense conduct (Vb) connect content (Aj)
contest (Vb) contract (Vb)

2 collect command commence compact (Aj, Vb)
complete

3 produce (Vb) progress (Vb) project (Vb) .promote
protect provide

4 object (Vb) o'clock polite :

5 corral correct forgot forlorn

U17 Frequency = 5

subject (Vb) subtract supply support
suspect (Vb)

117 Frequency = 2

cigar divide

Block 11 Frequency = 214

11,1 Frequency = 41

NG10 Frequency = 41

| | | | | |
|----------|------------|----------|----------|----------|
| <u>1</u> | backing | being | blessing | breeding |
| | camping | clipping | cutting | dashing |
| | dressng | drumming | ending | filling |
| | greeting | helping | landing | licking |
| | meeting | mending | packing | rocking |
| | setting | spelling | stuffing | tatting |
| | thrilling | trimming | trying | warning |
| | wedding | willing | | |
| <u>2</u> | cunning | darling | duckling | dumpling |
| | herring | kindling | morning | shirting |
| | stocking | | | |
| <u>3</u> | hanqar (P) | kingdom | | |

11,2 Frequency = 97

CH10 Frequency = 66

| | | | | |
|------------|-----------------|-------------|----------|----------|
| <u>1b</u> | chat | check | cheek | cheer |
| | chess | chick | chill | chin |
| | chip | chop | chuck | chug |
| | chum | | | |
| <u>2b</u> | beech | much | rich | such |
| <u>3a</u> | charm | chart | chest | chime |
| | chink | chirp | choke | chore |
| | chunk | church | churn | |
| <u>3b</u> | speech | | | |
| <u>4b</u> | belch | bench | birch | bunch |
| | hunch | inch | lunch | march |
| | munch | perch | pinch | porch |
| | punch | ranch | torch | |
| <u>4d</u> | branch | crunch | French | starch |
| | trench | | | |
| <u>6a</u> | workbench | | | |
| <u>6b</u> | cheery | chilly | crunchy | rancher |
| <u>7a</u> | channel | chapter | chatter | checker |
| | cherry | chicken | children | chipmunk |
| | chubby | | | |
| <u>7b</u> | attach | sandwich(P) | | |
| <u>7c</u> | merchant | orchard | | |
| <u>10a</u> | chitter-chatter | | | |

11,2 (con't) TCH10 Frequency = 29

| | | | | |
|-----------|------------|----------|-----------|---------|
| <u>2a</u> | itch | | | |
| <u>2b</u> | batch | catch(P) | ditch | fetch |
| | hatch | hitch | latch | match |
| | notch | patch | pitch | thatch |
| | witch | | | |
| <u>3b</u> | crutch | Scotch | sketch | stitch |
| | switch | | | |
| <u>5e</u> | scratch | stretch | | |
| <u>6a</u> | hopscotch | | | |
| <u>6b</u> | catcher(P) | pitcher | stretcher | |
| <u>7c</u> | catchup(P) | hatchet | kitchen | satchel |

11,3 Frequency = 23

WH10 Frequency = 23

| | | | | |
|-----------|----------|-----------|---------|--------|
| <u>1a</u> | why | | | |
| <u>1b</u> | whack | wheel | when | which |
| | whip | whiz | whizz | |
| <u>3a</u> | whale | wharf | while | whine |
| | whirl | white | | |
| <u>6a</u> | bobwhite | whalebone | | |
| <u>6b</u> | wheeler | | | |
| <u>7a</u> | whimper | whinny | whisker | whisky |
| | whisper | | | |
| <u>7c</u> | awhile | | | |

1

11,4 Frequency = 24

QU10 Frequency = 24

| | | | | |
|-----------|-----------|----------|---------|---------|
| <u>1b</u> | quack | queen | queer | quick |
| | quit | quiz | | |
| <u>3a</u> | quake | quart | quilt | quite |
| | quote | | | |
| <u>5c</u> | square | squeeze | squirm | squirt |
| <u>6a</u> | quicksand | | | |
| <u>6b</u> | quicken | quickly | | |
| <u>7a</u> | quarrel | quarry | quartet | quarter |
| <u>7c</u> | banquet | squirrel | | |

11,5 Frequency = 19

GG10 Frequency = 17

| | | | | |
|----------|---------|----------|--------|---------|
| <u>1</u> | egg | eggplant | | |
| <u>2</u> | baggage | beggar | buggy | dagger |
| | giggle | maggot | nugget | piggish |
| | ragged | rugged | shaggy | stagger |
| | waggle | wiggle | viggly | |

CC12 Frequency = 2

hiccup soccer

11,6 Frequency = 10

G31 Frequency = 10

| | | | | |
|----------|--------|--------|--------|------|
| <u>1</u> | get | gift | gig | gill |
| | girl | | | |
| <u>2</u> | anger | finger | linger | |
| <u>3</u> | forget | target | | |

Block 12 Frequency = 476

12,1 Frequency = 49

AY10 Frequency = 49

| | | | | |
|-----------|------------|----------|-----------|---------|
| <u>2a</u> | bay | day | gay | hay |
| | jay | lay | may | nay |
| | pay | ray | say | way |
| <u>3b</u> | brav | clay | gray | play |
| | pray | slay | stay | sway |
| | tray | | | |
| <u>5b</u> | spray | stray | | |
| <u>6a</u> | ashtray | birthday | crayfish | daytime |
| | driveway | haycock | haystack | maybe |
| | pathway | playmate | plaything | runway |
| | week day | | | |
| <u>6b</u> | grayish | payment | player | saying |
| <u>7b</u> | away | display | midway | subway |
| | Sunday (P) | | | |
| <u>7c</u> | crayon | layer | mayor | prayer |

12,2 Frequency = 184 ,

EAll Frequency = 141

| | | | | |
|------------|----------|-----------|----------|------------|
| <u>lai</u> | pea | sea | tea | |
| <u>ii</u> | flea | plea | | |
| <u>iii</u> | peacock | peanut | seashore | seasick |
| | seaweed | teacup | teapot | |
| <u>lbi</u> | deal | heal | meal | peal |
| | real | seal | | |
| <u>ii</u> | squeal | steal | | |
| <u>iii</u> | misdeal | really | sealskin | |
| <u>iv</u> | appeal | realize | | |
| <u>lc</u> | beam | seam | team | |
| <u>ii</u> | cream | dream | scream | steam |
| | stream | | | |
| <u>iii</u> | steamer | steamship | streamer | streamline |
| | sunbeam | upstream | | |
| <u>ldi</u> | beach | each | leach | peach |
| | reach | teach | | |
| <u>ii</u> | preach | | | |
| <u>iii</u> | preacher | teacher | teaching | |
| <u>le</u> | cheap | heap | leap | reap |
| <u>lfi</u> | leash | peace | | |
| <u>iv</u> | beacon | eager | eagle | |

| | | | | | |
|--------------|------------|-----------|---------|----------|---------|
| 12,2 (con't) | <u>2ai</u> | dear | ear | fear | gear |
| | | hear | near | rear | sear |
| | | shear | tear(N) | year | |
| | <u>ii</u> | clear | smear | spear | |
| | <u>iii</u> | dearly | earring | near-by | nearly |
| | | smeary | shearer | yearly | |
| | <u>iv</u> | dreary | weary | | |
| | <u>2bi</u> | beat | cheat | feat | eat |
| | | heat | meat | neat | peat |
| | | seat | wheat | | |
| | <u>ii</u> | bleat | pleat | treat | |
| | <u>iii</u> | beaten | beater | eaten | heater |
| | | mincemeat | neatly | neatness | |
| | <u>2ci</u> | beak | leak | peak | weak |
| | <u>ii</u> | bleak | creak | reak | squeak |
| | | streak | | | |
| | <u>iii</u> | leaky | squeaky | | |
| | <u>2d</u> | bean | lean | mean | wean |
| | <u>ii</u> | clean | | | |
| | <u>iii</u> | beanbag | cleaner | cleanup | meaning |
| | | meanwhile | | | |

| | | | | | |
|--------------|------------|----------------|------------|----------------------|-------------------|
| 12,2 (con't) | <u>2ei</u> | beast | east | feast | least |
| | | yeast | | | |
| | <u>iii</u> | northeast | | | |
| | <u>iv</u> | Easter | | | |
| | <u>3a</u> | bead | lead (Vb) | read (present tense) | |
| | <u>iii</u> | beaded | leader | reading | |
| | <u>iv</u> | beadle | | | |
| | <u>3bi</u> | leaf | | | |
| | <u>iii</u> | leafy | | | |
| | <u>3ci</u> | leave | weave | | |
| | <u>3di</u> | heath | | | |
| EA31 | | Frequency = 43 | | | |
| | <u>li</u> | health | wealth | | |
| | <u>iii</u> | healthy | wealthy | | |
| | <u>3ai</u> | dead | head | lead (N) | rear (past tense) |
| | <u>ii</u> | bread | dread | spread | stead |
| | | thread | tread | | |
| | <u>iii</u> | bedstead | forehead | heading | homestead |
| | | instead | threadbare | | |
| | <u>iv</u> | ahead | ready | steady | |
| | <u>3b</u> | bear | pear | tear (V) | wear |
| | <u>ii</u> | swear | | | |
| | <u>iii</u> | bearskin | | | |
| | <u>3ci</u> | deaf | death | | |
| | <u>ii</u> | breath | breast | dreamt | sweat |
| | <u>iii</u> | breastplate | redbreast | sweater | sweaty |
| | <u>iv</u> | breakfast | heaven | heavy | weapon |

12,3 Frequency = 143

0011 Frequency = 89

| | | | | |
|------------|------------|-----------|-----------|-----------|
| <u>lai</u> | boo | coo | moo | too |
| | zoo | | | |
| <u>iv</u> | bamboo | boohoo | igloo | shampoo |
| | tattoo | | | |
| <u>lbi</u> | coon | loon | moon | noon |
| | soon | | | |
| <u>ii</u> | spoon | | | |
| <u>iii</u> | forenoon | moonbeam | noonday | noontime |
| | teaspoon | | | |
| <u>iv</u> | balloon | cartoon | cocoon | harpoon |
| | raccoon | saloon | | |
| <u>lci</u> | boom | loom | room | |
| <u>ii</u> | bloom | broom | groom | |
| <u>iii</u> | bathroom | bedroom | bloomer | blooming |
| | broomstick | classroom | gloomy | lunchroom |
| | playroom | roommate | stateroom | storeroom |
| <u>ldi</u> | coop | hoop | loop | whoop |
| <u>ii</u> | droop | scoop | stoop | swoop |
| | troop | | | |
| <u>lei</u> | booth | tooth | | |
| <u>iii</u> | toothbrush | toothpick | | |
| <u>lfi</u> | boost | roost | | |
| <u>iv</u> | rooster | | | |

| | | | | | |
|--------------|-------------|-----------|---------|---------|------|
| 12,3 (con't) | <u>2i</u> | cool | fool | pool | tool |
| | <u>ii</u> | spool | stool | | |
| | <u>iii</u> | cooler | foolish | toolbox | |
| | <u>3aii</u> | boot | hoot | loot | root |
| | | shoot | toot | | |
| | <u>iii</u> | shooter | | | |
| | <u>iv</u> | bootee | scooter | | |
| | <u>3bi</u> | food | mood | | |
| | <u>ii</u> | brood | | | |
| | <u>iv</u> | poodle | | | |
| | <u>3ci</u> | roof | | | |
| | <u>ii</u> | proof | | | |
| | <u>iii</u> | fireproof | | | |
| | <u>3di</u> | moor | poor | | |
| | <u>3eiv</u> | spooky | | | |

12,3 (con't) 0012 Frequency = 54

| | | | | |
|-------------|-----------|----------|----------|----------|
| <u>2i</u> | book | cook | hook | look |
| | looks | nook | rook | shook |
| | took | | | |
| <u>ii</u> | brook | crook | | |
| <u>iii</u> | bookman | cookbook | cooker | cooky |
| | crooked | fishhook | hooky | notebook |
| | scrapbook | textbook | unhook | |
| <u>iv</u> | booklet | | | |
| <u>3ai</u> | good | hood | wood | |
| <u>ii</u> | stood | | | |
| <u>iii</u> | driftwood | firewood | good-by | goodness |
| | goodwill | goody | manhood | redwood |
| | wandchuck | wooded | wooden | woodland |
| | woodpile | woodshed | woodwork | woody |
| <u>3bi</u> | foot | spot | | |
| <u>iii</u> | barefoot | footstep | | |
| <u>iv</u> | afoot- | | | |
| <u>3ci</u> | wool | | | |
| <u>iii</u> | woolen | woolly | | |
| <u>3di</u> | hoof | woof | | |
| <u>3civ</u> | whoopie | | | |

12,4 Frequency = 102

0W11 Frequency = 59

| | | | | |
|-----------|-----------|-----------|-----------|------------|
| <u>1b</u> | owe | own | | |
| <u>2a</u> | bow(N) | low | mow(Vb) | row(Vb, N) |
| | show | sow(Vb) | tow | |
| <u>2b</u> | bowl | shown | sown | |
| <u>3b</u> | blow | crow | flow | glow |
| | grow | slow | snow | stow |
| | throw | | | |
| <u>4b</u> | blown | flown | grown | thrown |
| <u>6a</u> | grownup | scarecrow | showman | slowpoke |
| | snowbank | snowbird | snowdrift | snowdrop |
| | snowflake | snowman | snowstorm | |
| <u>6b</u> | bowling | grower | lowly | owner |
| | slowly | snowy | | |
| <u>7b</u> | bel!ow | borrow | elbow | fellow |
| | follow | furrow | hollow | meadow |
| | mellow | minnow | morrow | pillow |
| | sorrow | tallow | willow | window |
| | yellow | | | |

12,4 (con't) 0W12 Frequency = 43

1a ow

1b owl

2a bow(Vb, N) chow cow how
mow(N) now row(N) sow(N)
wow

2b down fowl gown howl
town

3b brow plow

4b brown clown crowd crown
drown frown growl

6a howwow downtown somehow uptown

6b brownish downy downward

7b allow

7c bowel bower coward flower
howdy powder power shower
tower vowel

Block 13 Frequency = 197

13,1 Frequency = 73

031 Frequency = 38

| | | | | |
|-----------|------------|----------|----------|------------|
| <u>2b</u> | son | ton | won | |
| <u>4a</u> | come | done | dove (N) | love |
| | month | none | shove | some |
| <u>4b</u> | from | | | |
| <u>5a</u> | front | glove | | |
| <u>6a</u> | frontward | grandson | lonesome | someday |
| | something | sometime | tiresome | |
| <u>6b</u> | lovely | sonny | undone | |
| <u>7a</u> | oven | | | |
| <u>7c</u> | above | among | color | compass |
| | cover | dozen | govern | income (P) |
| | Monday (P) | nothing | shovel | welcome |
| | worder | | | |

U31 Frequency = 35

| | | | | |
|----------|----------|----------|----------|-----------|
| <u>1</u> | bull | bush | full | pull |
| | push | puss | put | |
| <u>2</u> | armful | bashful | careful | cheerful |
| | cupful | dreadful | graceful | grateful |
| | handful | harmful | hateful | healthful |
| | helpful | peaceful | playful | skillful |
| | spoonful | thankful | | |
| <u>3</u> | bullet | bully | bushel | bushy |
| | butcher | fullback | pudding | pullman |
| | pulpit | pussy | | |

13,2 Frequency = 52

· A23 Frequency = 26

li all ball call fall
 gall hall tall wall

ii small stall

iii baseball fallen football hallway
 smallpox snowball snowfall

2i halt malt salt

iii halter malted salty

iv altar

· 3i bald

ii scald

023 Frequency = 26

li boll poll roll toll

ii troll

iii roller tollgate

2i bold cold fold gold
 hold mold old sold
 told

ii scold

iii folder golden goldfish holder
 molding olden

3i bolt colt jolt

13,3 Frequency = 72

122 Frequency = 21

| | | | | |
|------------|------------|-----------|----------|----------|
| <u>li</u> | bind | find | hind | kind |
| | mind | rind | wind(Vb) | |
| <u>ii</u> | blind | grind | | |
| <u>iii</u> | binder | blindfold | kindly | kindness |
| | winding | windup | | |
| <u>2i</u> | child | mild | wild | |
| <u>iii</u> | grandchild | wildcat | wildly | |

024 Frequency = 51

| | | | | |
|------------|-----------|----------|----------|-------|
| <u>lai</u> | dong | gong | long | song |
| | tong | | | |
| <u>ii</u> | strong | | | |
| <u>iii</u> | dingdong | | | |
| <u>iv</u> | along | oblong | | |
| <u>lbi</u> | bog | dog | fog | hoq |
| | log | tog | | |
| <u>ii</u> | clog | frog | | |
| <u>iii</u> | bulldog | doggy | dogwood | foggy |
| | hotdog | leapfrog | | |
| <u>lci</u> | off | | | |
| <u>iii</u> | blast-off | kickoff | take-off | |
| <u>iv</u> | coffee | coffin | office | |
| <u>ldi</u> | loft | soft | | |
| <u>iii</u> | hayloft | softly | | |

13,3 (con't)

1ei honk

3ai boss loss moss loss

ii cross

iii crossing glossy

iv across

3bi cost lost

ii frost

iii frosting frosty

iv ostrich

3ci moth

ii cloth

Block 14 Frequency = 80

14,1 Frequency = 35

Stressed VCc# Frequency = 35

| | | | | |
|-------------|----------|----------|--------|--------|
| <u>1a</u> | badge | bridge | dodge | edge |
| | fudge | hedge | judge | lodge |
| | pledge | | | |
| <u>1b</u> | hedgehog | | | |
| <u>1c</u> | badger | midget | | |
| <u>2a</u> | chance | dance | duce | fence |
| | glance | lance | mince | prance |
| | prince | since | | |
| <u>2ci</u> | dense | rinse | sense | |
| <u>2cii</u> | immense | nonsense | | |
| <u>3</u> | bulge | else | shelve | twelve |
| <u>4a</u> | bronze | grippe | | |
| <u>4b</u> | barrette | giraffe | | |

14,2 Frequency = 18

Stressed VrC# Frequency = 18

| | | | | |
|-----------|-----------|----------|---------|-------|
| <u>1a</u> | curse | horse | nurse | purse |
| | verse | worse | | |
| <u>1b</u> | horseback | converse | immerse | |
| <u>2</u> | carve | curve | nerve | serve |
| | starve | | | |
| <u>3</u> | charge | gorge | large | urge |

14,3 Frequency = 27

Unstressed VCc# and VCe Frequency = 27

| | | | | |
|----------|------------|----------|----------|----------|
| <u>1</u> | absence | distance | entrance | sentence |
| | substance | | | |
| <u>2</u> | bandage | cabbage | college | cottage |
| | garbage | message | package | passage |
| | village | | | |
| <u>3</u> | furnace | justice | lettuce | necklace |
| | practice | service | surface | |
| <u>4</u> | capsule(P) | engine | fertile | injure |
| <u>5</u> | orange | porridge | | |

Third-Year Word List

Frequency = 3213

B k 15 Frequency = 904

15,1 Frequency = 84

8-9 one-syllable words with first-year rules, Frequency = 84

| | | | |
|-------|-------|--------|--------|
| Alps | bluff | brag | breed |
| brim | brisk | bunt | clank |
| clash | cier | clomp | cog |
| crock | deem | disc | dwelt |
| flank | flask | flunk | flush |
| fund | gland | gosh | grasp |
| gull | gust | gut | helm |
| hiss | jazz | lab | leer |
| lest | loll | lull | 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 = 820

8-9 words with second-year rules, Frequency = 820

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 All | bate | blare | crape | gape |
| | gaze | glaze | hale | maze |
| | rape | shale | vale | |
| III | bile | file | pike | prime |
| | sire | spire | strife | swine |
| | thine | wile | | |
| 6,2 011 | bole | cope | cove | doze |
| | drone | grope | pore | Rome |
| | rote | shone | stoke | strode |
| | yore | | | |
| III | 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 = 47

8,1 Compounds

| | | | |
|-----------|----------|-----------|-----------|
| backbone | bedside | brimstone | firebug |
| glassware | hereby | hotline | lampshade |
| lifetime | red-wing | sandstone | shipmate |
| spruce-up | | | |

| | | | | |
|---------|-------------|-------------|--------------|-----------|
| 8,2 A16 | abstract | ally | alpine | athlete |
| | baptize | bankrupt | capsize | cashmere |
| | mascot | pastime | shamrock | |
| I16 | dictate | incline(N) | impact | insult(N) |
| | kidnap | linseed | mishap | |
| U16 | nutmeg | suffix | | |
| E16 | empire | extract(N) | textile | |
| O16 | bonbon | combat(N) | combine(N) | complex |
| | compress(N) | conflict(N) | construct(N) | contact |
| | contrast(N) | convict(N) | prospect | |

Block 9 Frequency = 35

9,1 A21 harsh

| | | | | | |
|-----|-----|-------------|----------|------------|-------------|
| | 021 | scorn | shorts | snort | |
| | U21 | blur | blurt | burr | cur |
| | | surf | turf | | |
| | 121 | firm | | | |
| | E21 | serf | | | |
| 9,2 | E21 | blunder | butler | cancer | canker |
| | | capper | clatter | cobbler | convert (N) |
| | | creeper | cruller | culvert | differ |
| | | duster | elder | feeler | finder |
| | | 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 | slicker |
| | | smelter | snicker | splatter | stepper |
| | | sticker | suffer | tamper | tanner |
| | | tester | thriller | tinder | totter |
| | | usher | wicker | | |
| | U21 | burlap | surplus | surname | turnpike |
| | 121 | birthplace | | | |
| | A21 | boxcar | firearm | hardship | marker |
| | | parship | rampart | shipyard | |
| | U21 | borax | border | concord | corn cob |
| | | corn starch | export | import | leghorn |
| | | port hole | | | |

| | | | | | |
|----------|------------------|-----------|-----------|------------|-----------|
| 9,3 | A25 | lukewarm | warbler | warden | wariike |
| | | warp | warpath | warship | |
| | 022 | byword | | | |
| Block 10 | Frequency = 321, | | | | |
| 10,1 | 117 | antic | arctic | 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 | hamlet | haruness |
| | | harmless | helmet | helpless | hornet |
| | | hundredth | inlet | kindred | likeness |
| | | madness | marvel | minstrel | 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 |
| | 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 | sportsman |
| | stanza | sultan | trespass | tundra |
| | vassal | villa | warrant | westward |
| 017 | 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 | | | |
| 10,4 116 | disarm | discuss | disgust | dislike |
| | dispute | distinct | distract | impress |
| | infect | infest | inflamm | inhale |
| | insert (Vb) | insist | instruct | invade |
| | invest | misled | misspell | sincere |
| 116 | sub | subsist | unfit | unfurl |
| | unhand | unnurt | unkept | unpack |
| 016 | blockade | | | |
| A16 | abduct(P) | adhere(P) | cascade | stampede |
| | transmit | | | |
| E21 | permit (Vb) | perspire | | |
| 021 | ornate | | | |
| EE10 | canteen | exceed | foresee | misdeed |
| | unseen | | | |
| 10,5 A17 | abide | absurd | adapt | adore |
| | adorn | advice | affec | afame |
| | 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 |
| | extract | extreme | extinct | neglect |
| | secede | seclude | secure | severe |
| 017 | combat (Vb) | combine (Vb) | 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 |
| U17 | suppress | supreme | | |
| 117 | brigade | | | |

Block 11 Frequency = 61

| | | | | |
|-----------|-----------|-----------|----------|------------|
| 11,1 NG10 | bedding | dwelling | gangster | inning |
| | matting | netting | shilling | wording |
| 11,2 CH10 | arch | archer | bechnut | chant |
| | char | charter | cheep | chuckle |
| | cinch | drench | duchess | enchant |
| | gulch | hunchback | leech | parch |
| | parchment | scorch | starchy | |
| TCH10 | clutch | crotch | etch | hemstitch |
| | pitchfork | snatch | twitch | witchcraft |
| 11,3 WH10 | cartwheel | whit | whittle | |

| | | | | | |
|------|------|----------|----------|---------|----------|
| 11,4 | QU10 | acquire | conquest | jonquil | quench |
| | | quest | quill | quitter | quorum |
| | | squid | squint | squire | tranquil |
| 11,5 | GG10 | druggist | luggage | smuggle | snuggle |
| | | struggle | trigger | | |
| | CC12 | accord | occur | yucca | |
| 11,6 | G31 | gilt | hunger | | |

Block 12 Frequency = 107

| | | | | | |
|------|------|-----------|------------|------------|-----------|
| 12,1 | AY10 | array | betray | dismay | essay |
| | | fray | gateway | maypole | midday |
| | | portray | rayon | wayside | |
| 12,2 | EA11 | 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 | | |
| 12,3 | 0011 | bearer | bearing | bedspread | blockhead |
| | | breastpin | breathless | deadly | dealt |
| | | forbear | spreader | threat | threaten |
| | | bassoon | booh | bridegroom | croon |

| | | | | |
|-----------|------------|-----------|----------|-----------|
| | doom | foodstuff | gloom | groove |
| | maroon | monsoon | noodle | ooze |
| | poorly | roofing | roomer | scoot |
| | snoop | snooze | spook | woo |
| 0012 | bankbook | brooklet | foothill | footprint |
| | footstool | forefoot | godly | goodness |
| | woodman | | | |
| 12,4 0W11 | billow | blowtorch | blower | burrow |
| | growth | lowland | mower | mown |
| 0W12 | downstream | Moscow | prowl | rowdy |
| | scowl | sundown | tower | township |
| | vow. | | | |

Block 13 Frequency = 57

| | | | | |
|----------|----------|------------|-----------|-----------|
| 13,1 031 | comfort | fearsome | hovel | hover |
| | London | monk | monthly | someplace |
| 031 | bullhead | fearful | fully | glassful |
| | hopeful | pushcart | shameful | shot-put |
| | sinful | | | |
| 13,2 023 | handball | install | squall | |
| 023 | ahold | enroll | goldfinch | goldsmith |
| | molder | stroll | unfold | uphold |
| | volt | | | |
| 13,3 122 | binder | blinding | childhood | childish |
| | grinder | grindstone | markind | unkind |
| 024 | 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 |
| | surge | surge | | |
| 14,3 | active | bondage | captive | challenge |
| | doctrine | ermine | hostile | instance |
| | mileage | terrace | tonnage | |

Block 16 Frequency = 488

16,1 Frequency = 135

· A110 Frequency = 135

| | | | | |
|------------|--------|--------|--------|-------|
| <u>1bi</u> | aid | ail | aim | |
| <u>ii</u> | air | | | |
| <u>2bi</u> | bail | bait | chain | fail |
| | faith | gain | gart | hail |
| | jail | laid | lain | maid |
| | mail | maim | main | nail |
| | paid | pail | pain | raid |
| | rail | rain | sail | tail |
| | vain | wail | wait | |
| <u>ii</u> | chair | fair | hair | lair |
| | pair | | | |
| <u>4ai</u> | faint | maize | paint | saint |
| | waist | | | |
| <u>4bi</u> | braid | brain | claim | drain |
| | flail | frail | grain | plain |
| | quail | slain | snail | staid |
| | stain | trail | train | trait |
| <u>ii</u> | stair | | | |
| <u>5a1</u> | quaint | | | |
| <u>5b1</u> | sprain | strain | strait | |

| | | | | | |
|--------------|------------|----------|--------------|------------|----------|
| to, t (cont) | <u>6ai</u> | bandage | bobtail | cattail | cocktail |
| | | hangnail | horsetail | mailbag | mailbox |
| | | mailman | mainland | nailfile | railway |
| | | raindrop | rainfall | shirtwaist | |
| | <u>ii</u> | airdale | airline | airplane | airport |
| | | airshaft | airship | airway | armchair |
| | | chairman | haircut | hairnet | hairpin |
| | | stairway | | | |
| | <u>6bi</u> | faithful | jailer | maiden | mainly |
| | | painter | painting | plainly | railing |
| | | rainy | strainer | trainer | waiter |
| | | unpaid | | | |
| | <u>ii</u> | airy | fairly | hairy | unfair |
| | <u>7ci</u> | acquaint | afraid | attain | await |
| | | complain | complaint | contain | daily |
| | | dainty | drainage | exclaim | explain |
| | | failure | gaily | maintain | mermaid |
| | | obtain | portrait (P) | restrain | sailor |
| | | sustain | tailor | traitor | waitress |
| | <u>ii</u> | affair | dairy | despair | fairy |

0010 Frequency = 98

| | | | | |
|------------|------------|------------|---|-----------|
| <u>1b</u> | couch | out | | |
| <u>11</u> | out | | | |
| <u>2a</u> | thou | | | |
| <u>2b1</u> | teat | couch | foul | loud |
| | mouth | noun | pouch | pout |
| | shout | south | | |
| <u>11</u> | sour | | | |
| <u>4a1</u> | bound | count | found | gouge |
| | bound | mound | mount | pound |
| | round | sound | round (17th past tense of <u>wind</u>) | |
| <u>4b1</u> | cloud | crouch | proud | scout |
| | slouch | snout | spout | stout |
| | trout | | | |
| <u>11</u> | flour | scour | | |
| <u>5a1</u> | ground | | | |
| <u>5b1</u> | ounce | lounge | ounce | pounce |
| | apron | | | |
| <u>6a1</u> | background | blowout | countdown | cutout |
| | dugout | fairground | foreground | hideout |
| | lookout | outfit | outline | outplay |
| | output | outrage | outside | outskirts |
| | playground | roundup | snowbound | southeast |
| | southwest | without | | |
| <u>9b1</u> | counter | countless | cloudy | founder |
| | loudly | mouthful | outer | outing |
| | prouter | proudly | roundist | touchy |
| | soundly | | | |

16,2 (con't)

7a_i

outlet

7c_i

about

account

aloud

amount

announce

around

compound

council

counsel

countess

county

discount

flounder

foundry

grouchy

pronounce

southward

surround

11

devour

16,3 Frequency = 89

0E10 Frequency = 7

1

doe

foe

hoe

toe

woe

2

tiptoe

toenail

16,3 (con't) 0A10 Frequency = 82

| | | | | |
|-------------|---------------|------------|-----------|-----------|
| <u>1bi</u> | oak | oat | oath | |
| <u>ii</u> | oar | | | |
| <u>2ai</u> | whoa | | | |
| <u>2bi</u> | boat | coach | coal | coax |
| | foam | goal | goat | load |
| | loaf | loam | loan | moan |
| | moat | poach | roach | road |
| | room | roam | shoal | soak |
| | soap | toad | | |
| <u>ii</u> | boar | roar | soar | |
| <u>4ai</u> | boast | coast | roast | toast |
| <u>ii</u> | board | hoard | | |
| <u>4bi</u> | bloat | cloak | croak | float |
| | groan | throat | | |
| <u>5bii</u> | coarse | hoarse | | |
| <u>6ai</u> | carload | charcoal | cloakroom | crossroad |
| | flatboat | lifeboat | oatmeal | railroad |
| | raincoat | roadside | rowboat | sailboat |
| | seacoast | stagecoach | steamboat | tugboat |
| | waistcoat (P) | | | |
| <u>ii</u> | billboard | blackboard | cardboard | seaboard |
| | sideboard | surfboard | uproar | |
| <u>6bi</u> | floating | coastal | coaster | loafer |
| | oaken | soapy | toaster | unload |
| <u>ii</u> | boarder | roaring | | |
| <u>7ci</u> | afloat | approach | roadster | |
| <u>ii</u> | aboard | | | |

16.4 Frequency = 61

W10 Frequency = 44

| | | | | |
|-----------|----------|------------|----------|---------|
| <u>1b</u> | ave | awl | | |
| <u>2a</u> | caw | jaw | law | paw |
| | raw | saw | thaw | |
| <u>2b</u> | bawl | dawn | fawn | hawk |
| | lawn | shawl | yawn | |
| <u>3b</u> | claw | craw | draw | |
| <u>4b</u> | crawl | drawn | spawn | |
| <u>5b</u> | sprawl | squaw | squawk | straw |
| <u>6a</u> | crawfish | drawbridge | jigsaw | lockjaw |
| | outlaw | rawhide | rickshaw | sawdust |
| | sawmill | seesaw | withdraw | |
| <u>6b</u> | drawing | lawful | | |
| <u>7a</u> | awful | awkward | awning | |
| <u>7c</u> | awkward | lawyer | | |

W10 Frequency = 17

| | | | | |
|-----------|----------|--------|---------|--------|
| <u>2b</u> | haul | maul | | |
| <u>4a</u> | fault | gauze | haunt | launch |
| | sauce | vault | | |
| <u>6a</u> | saucepan | | | |
| <u>7a</u> | auburn | August | author | |
| <u>7c</u> | applaud | faucet | laundry | saucer |

16,5 Frequency = 48

0110 Frequency = 26

| | | | | |
|-----------|----------|-------|---------|-------|
| <u>1b</u> | oil | | | |
| <u>2b</u> | boil | coil | coin | foil |
| | join | loin | soil | toil |
| <u>4a</u> | choice | joint | moist | point |
| | voice | | | |
| <u>4b</u> | broil | spoil | | |
| <u>5a</u> | spoilt | | | |
| <u>6a</u> | oilcloth | | | |
| <u>6b</u> | pointer | oily | | |
| <u>7a</u> | ointment | | | |
| <u>7c</u> | appoint | avoid | coinage | doily |
| | toilet | | | |

0Y10 Frequency = 22

| | | | | |
|-----------|---------|---------|---------|---------|
| <u>2a</u> | boy | coy | joy | toy |
| <u>6a</u> | bellboy | boyhood | cowboy | soybean |
| | tomboy | toyland | toyshop | |
| <u>6b</u> | boyish | joyful | | |
| <u>7a</u> | oyster | | | |
| <u>7b</u> | ahoy | annoy | destroy | employ |
| | enjoy | | | |
| <u>7c</u> | loyal | royal | voyage | |

16,6 Frequency = 57

UE10 Frequency = 20

| | | | | |
|-----------|----------|----------|---------|-----------|
| <u>2a</u> | due | hue | sue | |
| <u>2b</u> | duel | fuel | | |
| <u>3b</u> | blue | clue | flue | glue |
| | true | | | |
| <u>4b</u> | cruel | | | |
| <u>6a</u> | bluebell | bluebird | bluejay | blueprint |
| | skyblue | | | |
| <u>6b</u> | cruelly | untrue | | |
| <u>7b</u> | arque | rescue | | |

UI10 Frequency = 7

| | | | | |
|----------|-----------|------------|---------|--|
| <u>1</u> | fruit | juice | suit | |
| <u>2</u> | fruitcake | grapefruit | lawsuit | |
| <u>3</u> | pursuit | | | |

EW10 Frequency = 30

| | | | | |
|-----------|----------|---------|---------|----------|
| <u>2a</u> | chew | dev | few | meow |
| | new | pew | whew | |
| <u>3!</u> | blew | brew | crew | drew |
| | flew | grew | stew | threw |
| <u>5b</u> | screw | strew | strewn | |
| <u>6a</u> | brandnew | devdrop | newborn | New York |
| <u>6b</u> | newly | unscrew | | |
| <u>7b</u> | new | | | |
| <u>7c</u> | jew | pewter | sewage | sever |
| | steward | | | |

= always pronounced [ju:]
 = always pronounced [ju:]
 unasterisked words may be pronounced either [ju:] or [ju:], but [ju:] predominates.



block 17 Frequency = 402

17,1 Frequency = 123

three-syllable compounds Frequency = 123

| | | | |
|-----------------|---------------|--------------|-------------|
| afternoon | alderman | alongside | angleworm |
| applesauce | archbishop | backwoodsman | baggage |
| barbershop | basketball | battleship | blackberry |
| blueberry | bluebonnet | bric-a-brac | bumblebee |
| buttercup | butterfly | buttermilk | butternut |
| butterscotch | buttonhole | candlestick | cannonball |
| checkerboard | coffeepot | commonwealth | cottonseed |
| cottontail | cottonwood | crackerjack | cubbyhole |
| dairyman | fairyland | fellowman | ferryman |
| ferryboat | fangnail | fingerprnt | 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 |
| partnership | peppermint | pineapple | pocketbook |
| pumpkinseed (p) | pussycat | quarterback | quicksilver |

man [mæn]

man [mæn]

5 - [z]

17,1 (con't)

| | | | |
|----------------|--------------|---------------|---------------|
| rattlesnake | runaway | salesmanship# | silverware |
| skyrocket | southeastern | southwestern | sportsmanship |
| strawberry | storybook | summertime | sunbonnet |
| sunflower | tattletale | teakettle | tenderfoot |
| three-cornered | | thunderstorm | tinderbox |
| ting-a-ling | trustworthy | underbrush | underground |
| underline | underneath | underpass | undershirt |
| underskirt | understand | understood | undertake |
| undertook | underwear | uppercut | wildflower |
| windowpane | wintergreen | wintertime | wonderland |

17,2 Frequency = 162

-er Frequency = 45

- | | | | | |
|----------|---------|---------|---------|----------|
| <u>1</u> | baker | blazer | choker | diner |
| | diver | driver | glider | grader |
| | hater | liner | maker | miner |
| | pi-per | poker | Quaker | racer |
| | rider | rover | ruler | saver |
| | scraper | shaker | shiner | skater |
| | tamer | trader | tuner | voter |
| <u>2</u> | carver | dancer | freezer | ledger |
| | lover | weaver | | |
| <u>3</u> | fiddler | gobbler | muffler | peddler |
| | rattler | sampler | settler | sparkler |
| | tumbler | | | |
| <u>4</u> | drier | flier | | |

-en Frequency = 9

- | | | | | |
|--|--------|--------|-------|--------|
| | broken | frozen | ripen | shaken |
| | spoken | stolen | taken | waken |
| | woven | | | |

-ing Frequency = 16

- | | | | | |
|----------|----------|---------|---------|--------|
| <u>1</u> | aging | biting | boring | daring |
| | dining | icing | lining | making |
| | piling | saving | shaving | siding |
| | striking | tubing | | |
| <u>2</u> | bluing | carving | | |

-y Frequency = 14

- | | | | | |
|----------|--------|-------|-------|-------|
| <u>1</u> | bony | grimy | icy | scaly |
| | scary | shady | shaky | shiny |
| | smoky | stony | wavy | |
| <u>2</u> | fleecy | horsy | juicy | |

17,2 (con't) -s Frequency = 49

| | | | | |
|-----------|-----------|-----------|-------------|------------|
| <u>1a</u> | arms | arms | blinds | blues |
| | dues | eaves | goods | greens |
| | guns | hers | lens | means |
| | news | ours | shears | suds |
| <u>1b</u> | backwoods | beeswax | downstairs | insides |
| | newsboy | newsman | newsmen | salesman |
| | sideways | statesman | sweepstakes | tenpins |
| | upstairs | upwards | | |
| <u>1c</u> | gallows | goggles | manners | oodles |
| | pliers | rompers | rubbers | tidings |
| | tweezers | | | |
| <u>1d</u> | ourselves | selves | sheaves | themselves |
| | wives | | | |
| <u>2a</u> | blazes | glasses | riches | |
| <u>2b</u> | funnies | studies | | |

-ed Frequency = 29

| | | | | |
|-------------|-------------|------------|------------|------------|
| <u>1ai</u> | armed | bagged | barbed | bobbed |
| | chapped | charred | heeled | mashed |
| | skilled | tanned | webbed | winged (P) |
| <u>1aii</u> | checkered | concerned | hardboiled | tattered |
| <u>1b</u> | blessed (P) | peaked (P) | | |
| <u>2ai</u> | bored | tired | famed | striped |
| <u>2aii</u> | ashamed | freckled | refined | unruled |
| <u>2b</u> | dated | fated | | |
| <u>3</u> | candied | | | |

17,3 Frequency = 117

-er Frequency = 48

- | | | | | |
|-----------|----------------|-------------|-------------|----------------|
| <u>1a</u> | commander | container | customer | destroyer |
| | employer | follower | forester | gardener |
| | kidnapper | propeller | retainer | sharpener |
| | sufferer | trumpeter | transformer | |
| <u>1b</u> | announcer | condenser | divider | explorer |
| | producer | subscriber | villager | voyager |
| <u>2a</u> | anteater | bookkeeper | bootlegger | cowcatcher (P) |
| | dogcatcher (P) | frankfurter | hairstylist | hamburger |
| | innkeeper | kingfisher | nutcracker | penholder |
| | roadrunner | sheepherder | stonecutter | storekeeper |
| | woodcutter | woodpecker | | |
| <u>2b</u> | caretaker | dressmaker | lifesaver | outsider |
| | sandpiper | skyscraper | teenager | |

-en Frequency = 3

- | | | |
|--------|-----------|----------|
| awaken | forgotten | torsaken |
|--------|-----------|----------|

-ing Frequency = 12

- | | | | |
|-------------|--------------|--------------|--------------|
| bookkeeping | bottling (P) | concerning | fairyling |
| furnishings | happening | oncoming | outstanding |
| pertaining | seafaring | surroundings | Thanksgiving |

-ed Frequency = 6

- | | | | |
|-------------|-------------|---------|----------|
| assorted | back-handed | excited | forested |
| left-handed | redheaded | | |

17,3 (con't) -ly Frequency = 48

| | | | | |
|----------|------------|------------|--------------|------------|
| <u>1</u> | amblesly | 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 |
| <u>2</u> | angrily | cheerily | happily | heavily |
| | luckily | merrily | readily | steadily |
| <u>3</u> | awfully | carefully | cheerfully | faithfully |
| | gracefully | joyfully | peacefully | thankfully |

Block 18 Frequency = 412

18,1 Frequency = 304

E13 Frequency = 121

| | | | | |
|----------|------------|---------|-------------|---------|
| <u>1</u> | rebel (Vb) | recall | recede | recent |
| | recess | recite | record (Vb) | redeem |
| | reduce | refer | refine | reform |
| | refuel | regard | rejoice | relate |
| | relay | relent | rely | remain |
| | remains | remark | remind | rent |
| | rename | repaid | repair | repay |
| | repeal | repeat | report | request |
| | require | retail | retire | return |
| | reveal | revenge | reverse | revive |
| | revolve | reward | | |
| <u>2</u> | became | become | befall | before |
| | began | begin | begun | behave |
| | beheld | behind | behold | belong |
| | below | beneath | berate | beside |
| | beware | bewitch | beyond | |
| <u>3</u> | debate | decay | decent | decide |
| | decoy | deduct | defeat | defect |
| | defend | defense | define | delay |
| | demand | deny | depart | depend |
| | deport | detail | detect | device |
| <u>4</u> | elapse | elect | elope | equal |
| | era (P) | erect | even | event |
| | evil | | | |

18,1 (con't)

| | | | | |
|----------|------------|-----------|-------------|-----------|
| <u>5</u> | precede | predict | prefer | prefix |
| | prepaid | prepare | pretend | prevail |
| | prevent | | | |
| <u>6</u> | cedar | female | fever | frequent |
| | legal | meter | pecan (P) | scenic |
| | serum | tepee | | |
| <u>7</u> | beginner | belonging | beloved (P) | ally |
| | frequently | recently | reducer | laced |
| | reminder | reporter | revolver | revolving |

18.1 (con't) 013 Frequency = 72

| | | | | |
|----------|----------|----------|------------|-----------|
| <u>1</u> | oboe | odor | omit | opal |
| | open | oval | over | |
| <u>2</u> | proceed | prolong | protest | |
| | opus | 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 | |
| <u>4</u> | clover | crocus | grocer | pronoun |
| | slogan | storage | | |
| <u>5</u> | moreover | motorcar | motorman | opener |
| | opening | orally | overalls | overboard |
| | overcast | overcoat | overcome | overflow |
| | overhaul | overhead | overhear | overjoyed |
| | overland | overlook | oversleep | overtake |
| | overturn | | | |

18,1 (con't) A13 Frequency = 43

| | | | | |
|----------|-----------|-----------|-----------|------------|
| <u>1</u> | 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 | | | |
| <u>2</u> | babytalk | flavoring | laborer | ladybug |
| | landlady | lazily | newspaper | sabertooth |
| | sandpaper | wallpaper | | |

113 Frequency = 39

| | | | | |
|----------|---------------|---------|----------|------------|
| <u>1</u> | ideal | iris | Irish | item |
| | ivy | | | |
| <u>2</u> | china (China) | cider | digest | direct (P) |
| | divan (P) | fiber | final | financé |
| | license | lilac | minor | minus |
| | minute (Aj) | pilot | pirate | rival |
| | silence | silent | siren | tidy |
| | tiger | tiny | viking | vizor |
| | viry | | | |
| <u>3</u> | bridal | climate | Friday | private |
| | spider | spiral | | |
| <u>4</u> | chinaware | finally | silently | |



18,1 (con't) U13 Frequency = 29

| | | | | |
|-----------|------------|-------------|------------|---------|
| <u>1i</u> | Cuba | cubic * | duty | hula * |
| | human (P) | humane *(P) | humor *(P) | July |
| | puny * | pupil * | ruby * | rumor * |
| | tulip | tunic | tutor | unit * |
| | unite * | | | |
| <u>ii</u> | during | jury | mural * | rural * |
| <u>2i</u> | brunette * | brutal * | plumage * | student |
| | stupid | truly * | | |
| <u>ii</u> | plural | | | |
| <u>3</u> | superman | | | |

* = always pronounced [u]
 * = always pronounced [yu]

Unasterised words may be pronounced either [u] or [yu], but [u] predominates.

18,2 Frequency = 151

S20 Frequency = 94

2a use (Vb)

2b cause cheese chose close (Vb)

fuse hose noise nose

pause pose raise rise

rose these those wise

3b bruise cruise praise prose

clause

6a crosswise likewise primrose rosebud

rosewood sunrise

6b chosen easy noisy noiseless

rosy unused unwise wisely

7b abuse (Vb) accuse advise amuse

applause arise arose because (P)

Chinese (P) compose comprise confuse

despise excuse expose oppose

refuse repose suppose surprise (P)

7c daisy desert (Vb) deserve desire

drowsy laser miser music

peasant poison pleasant present (Vb)

preserve preside presume raisin

reason resent reserve resist

resolve resort result rosette

season thousand thousandth treason

trousers weasel

18,2 (con't)

8a cheeseburger cheesecloth

8b amusing composer easily pleasantly

seasoning noiselessly

S21 Frequency = 56

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

| | | | | |
|----------|-------------|-------------|---------|----------|
| <u>1</u> | Arab | baron | caret | carol |
| | caroler | grandparent | parent | Paris |
| | tariff | vary | | |
| <u>2</u> | arrow | arrowhead | barrel | barren |
| | carrier | carrot | carry | carryall |
| | garret | harrow | marrow | marry |
| | narrow | parrot | sparrow | tarry |
| | wheelbarrow | | | |
| <u>3</u> | scarce | scarcely | | |

18,4 Frequency = 28

025 Frequency = 28

| | | | | |
|----------|--------|-------|-------|--------|
| <u>1</u> | fro | go | ho | lo |
| | no | so | | |
| <u>2</u> | hero | hobo | polo | silo |
| | solo | yoyo | zero | |
| <u>3</u> | alto | auto | banjo | bingo |
| | bronto | cargo | fatso | grotto |
| | jello | lasso | lotto | motto |
| | stucco | | | |
| <u>4</u> | aqo | hello | | |

Block 19 Frequency = 287

19,1 Frequency = 81

-ment Frequency = 23

| | | | | |
|----------|--------------|-------------|------------|-------------|
| <u>1</u> | advancement | agreement | amendment | amusement |
| | announcement | appointment | attainment | contentment |
| | employment | enjoyment | engagement | enrollment |
| | equipment | excitement | government | investment |
| | settlement | | | |

| | | | | |
|----------|------------|------------|-------------|------------|
| <u>2</u> | apartment | assortment | compartment | department |
| | deportment | embankment | | |

-or Frequency = 14

| | | | | |
|----------|-----------|------------|------------|----------|
| <u>1</u> | conductor | contractor | director | erector |
| | governor | inspector | instructor | inventor |
| | professor | projector | | |

| | | | | |
|----------|---------|----------|---------|----------|
| <u>2</u> | advisor | dictator | equator | survivor |
|----------|---------|----------|---------|----------|

-ive Frequency = 14

| | | | | |
|----------|-------------|-----------|------------|------------|
| <u>1</u> | attractive | detective | digestive | effective |
| | excessive | inventive | oppressive | possessive |
| | progressive | | | |

| | | | | |
|----------|-------------|-----------|-----------|-----------|
| <u>2</u> | destructive | exclusive | expensive | explosive |
| | extensive | | | |

-ness Frequency = 12

| | | | | |
|----------|--------------|-------------|-------------|------------|
| <u>1</u> | carelessness | eagerness | foolishness | gentleness |
| | politeness | selfishness | | |

| | | | | |
|----------|------------|-------------|-----------|----------|
| <u>2</u> | bushiness | cleanliness | happiness | laziness |
| | loveliness | readiness | | |

19,1 (con't) -ance/-ant Frequency = 18

| | | | | |
|----------|-------------|------------|------------|------------|
| <u>1</u> | acceptance | admittance | allowance | appearance |
| | assistance | assistant | attendance | attendant |
| | performance | | | |
| <u>2</u> | alliance | endurance | ignorance | ignorant |
| <u>3</u> | abundance | abundant | accordance | importance |
| | important | | | |

19,2 Frequency = 88

1E11 Frequency = 8

| | | | | |
|----------|--------|---------|-------|-----|
| <u>1</u> | die | fie | lie | pie |
| | tie | | | |
| <u>2</u> | magpie | necktie | untie | |

124 + GH10 ~~Frequency~~ = 60

| | | | | |
|-----------|-------------|------------|--------------|--------------|
| <u>2a</u> | high | sigh | thigh | |
| <u>2b</u> | fight | light | might | night |
| | right | sight | tight | |
| <u>4a</u> | tights | | | |
| <u>4b</u> | blight | bright | flight | fright |
| | plight | slight | | |
| <u>6a</u> | airtight | daylight | flashlight | foresight |
| | headlight | highchair | highjump | highland |
| | highway | lighthouse | midnight | moonlight |
| | nightgown | nighttime | right-hand | skylight |
| | streetlight | sunlight | upright | |
| <u>6b</u> | brighten | brightly | brightness | fighter |
| | frighten | frightful | highly | lighter |
| | lightly | mighty | relight | rightly |
| | slightly | tighten | tightly | |
| <u>7c</u> | delight | lightning | tonight | twilight |
| <u>8a</u> | overnight | | | |
| <u>8b</u> | delighted | highlander | right-handed | sight-seeing |

19,2 (con't) GH10 Frequency = 13

| | | | | |
|----------|-----------|----------------|------------|---------|
| <u>1</u> | bough | plough | | |
| <u>2</u> | caught | naught | straight | taught |
| <u>3</u> | daughter | granddaughter | naughty | naughty |
| | slaughter | slaughterhouse | straighten | |

H20 Frequency = 7

| | | | | |
|----------|--------|----------|-----|--|
| <u>1</u> | herb | hour | | |
| <u>2</u> | huh | pooh | ugh | |
| <u>3</u> | graham | shepherd | | |

19,3 Frequency = 59

K20 Frequency = 26

| | | | | |
|-----------|-------------|----------|------------|----------|
| <u>1a</u> | knee | knew | know | |
| <u>1b</u> | knack | knead | kneel | knell |
| | knit | knob | knock | knoll |
| | knot | | | |
| <u>3a</u> | knave | knelt | knife | knight |
| <u>6a</u> | jackknife | knapsack | knighthood | knothole |
| <u>6b</u> | pocketknife | topknot | | |
| <u>6b</u> | knotty | unknown | | |
| <u>7a</u> | knickers | knuckle | | |

G20 Frequency = 9

| | | | | |
|-----------|----------|------------|--------|--------|
| <u>1</u> | gnat | gnaw | | |
| <u>2a</u> | assign | assignment | design | resign |
| | sign | signboard | | |
| <u>2b</u> | campaign | | | |

19,3 (cont.) W20 Frequency = 24

| | | | | |
|-----------|-------------|---------|----------|---------|
| <u>1b</u> | wrap | wrath | wreath | wreck |
| | wren | wretch | wring | wrong |
| <u>3a</u> | wrench | wrist | write | wrote |
| <u>6a</u> | shipwreck | | | |
| <u>6b</u> | rewrite | unwrap | wrapper | wrecker |
| | wringer | writer | | |
| <u>7a</u> | wriggly | wrinkle | wristlet | written |
| <u>8a</u> | handwriting | | | |

19,4 Frequency = 13

B20 Frequency = 13

| | | | | |
|-----------|----------|----------|-----------|------|
| <u>2b</u> | bomb | dumb | lamb | limb |
| | numb | thumb | | |
| <u>3b</u> | crumb | plumb | | |
| <u>6a</u> | dumbbell | lambskin | thumbtack | |
| <u>6b</u> | bomber | plumber | | |

19,5 Frequency = 40

L20 Frequency = 21

| | | | | |
|-----------|-----------|------------|-----------|----------|
| <u>1a</u> | balk | chalk | stalk | talk |
| | walk | | | |
| <u>1t</u> | to m talk | chalkboard | cornstalk | sidewalk |
| | talker | walker | | |
| <u>2</u> | folk | kinsfolk | yolk | |
| <u>3</u> | behalf | calf | half | halfway |
| <u>4</u> | calves | salve | | |
| <u>5</u> | calves | | | |

T20 Frequency = 19

| | | | | |
|----------|--------|---------|---------|--------------|
| <u>1</u> | rustle | bustle | castle | aristie |
| | rustle | jostle | nestle | rustle |
| | rustle | trebble | whistle | wrestle |
| <u>2</u> | listen | alisten | listen | listener (P) |
| | listen | | | |
| <u>3</u> | soften | soften | | |

13,6 Frequency = 6

L20 Frequency = 6

| | | | | |
|----------|-------|-----------|-------|-------|
| <u>1</u> | guard | guess | quest | guide |
| <u>2</u> | quilt | safeguard | | |

Block 20 Frequency = 119

 20,1 Frequency = 48

y Frequency = 12

1 armory armory cannery creamery

 Germany pottery unity

2 injury sunshiny

3 agency loyalty rivalry

-ful Frequency = 8

 colorful forgetful plentiful (y [i] → i [i])

 powerful sorrowful teacupful teaspoonful

 wonderful

-al Frequency = 7

1 orbital personal renewal musical

2 arrival festival recital

-able Frequency = 6

1 passable peaceable seeable suitable

2 likable lovable

-eth Frequency = 5

 fiftieth fortieth sixtieth thirtieth

 twentieth

-less Frequency = 4

 colorless odorless penniless (y [i] → i [i])

 regardless

-ist Frequency = 4

 loyalist motorist organist soloist

-ish Frequency = 2

 kittenish yellowish

20,2 Frequency = 39

PH10 Frequency = 19

| | | | | |
|-----------|---------|----------|-----------|---------|
| <u>3a</u> | phase | phone | | |
| <u>3b</u> | graph | | | |
| <u>4c</u> | phrase | | | |
| <u>5c</u> | sphere | sphinx | | |
| <u>7a</u> | phantom | pheasant | phony | photo |
| <u>7c</u> | asphalt | camphor | graphic | nephew |
| | orphan | pamphlet | phosphate | prophet |
| | sulphur | | | |

CH31 Frequency = 20

| | | | | |
|-----------|--------------|---------------|------------|-------------|
| <u>3a</u> | chord | | | |
| <u>4c</u> | chrome | | | |
| <u>5a</u> | school | | | |
| <u>5c</u> | scheme | | | |
| <u>6a</u> | schoolbag | schoolbook | schoolboy | schoolhouse |
| | schoolmate | schoolroom | schooltime | |
| <u>6b</u> | schooling | | | |
| <u>7a</u> | chorus | christen | | |
| <u>7b</u> | stomach | | | |
| <u>7c</u> | echo | orchid | schooner | |
| <u>8a</u> | schoolmaster | schoolteacher | | |

20,3 Frequency = 26

TH12 Frequency = 26

| | | | | |
|-----------|------------|-----------|------------|-------------|
| <u>1a</u> | bother | brother | farther | feather |
| | further | gather | leather | mother |
| | other | rather | smother | weather |
| | whether | whither | wither | |
| <u>1b</u> | brotherly | gatherer | godmother | grandmother |
| | leathery | otherwise | pinfeather | stepmother |
| | weatherman | | | |
| <u>2</u> | northern | | | |
| <u>3</u> | breathe | | | |

20,4 Frequency = 6

CC11 Frequency = 6

| | | | | |
|----------|------------|------------|---------|---------|
| <u>1</u> | accent | accept | succeed | success |
| <u>2</u> | acceptance | successful | | |

Block 21 Frequency = 177

21,1 Frequency = 37

un- Frequency = 19

| | | | |
|-----------|------------|-----------|-------------|
| unbroken | unbuckle | unbutton | unconcerned |
| uncover | uneasy | uneven | unhappy |
| unharness | unhealthy | uninjured | unlawful |
| unlucky | unpleasant | unruly | unselfish |
| untangled | untidy | unwelcome | |

re- Frequency = 6

| | | | |
|----------|-------------|---------|----------|
| readmit | reconstruct | recover | re-elect |
| 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 |
| mentioN | motioN | nation | notioN |
| portioN | potioN | section | statioN |
| tractioN | | | |

2a

| | | | |
|--------------|-------------|------------|-------------|
| adoption | attraction | collection | connection |
| construction | contraction | correction | direction |
| distinction | election | eruption | exception |
| extraction | infection | inspection | instruction |
| invention | objection | prevention | protection |
| selection | subtraction | | |

2b

| | | | |
|------------|-----------|-----------|------------|
| affection | carnation | commotion | confection |
| proportion | salvation | solution | |

3

| | | | |
|-------------|-----------|----------|----------|
| devotion | dictation | donation | location |
| oration | promotion | relation | rotation |
| translation | vacation | | |

4a

| | | | |
|------------|------------|------------|----------|
| formation | foundation | plantation | taxation |
| temptation | | | |

4b

| | | | |
|-----------|------------|--|--|
| quotation | starvation | | |
|-----------|------------|--|--|

5

| | | | |
|--------------|-------------|-------------|-------------|
| attention | conjunction | convention | description |
| destruction | detention | inscription | intention |
| junction | production | reception | reduction |
| subscription | | | |

6

| | | | |
|------------|-----------|--|--|
| fractional | sectional | | |
|------------|-----------|--|--|

7

| | | | |
|----------|-----------|------------|--|
| question | digestion | suggestion | |
|----------|-----------|------------|--|

21,3 Frequency = 32

-sion → [ʃən] Frequency = 20

- 1a mission session
- 1bi confession discussion expression impression
- possession profession
- 1bii admission commission permission
- 1biii percussion procession succession
- 2a mansion pension tension
- 2b convulsion dimension expansion

-sion → [zən] Frequency = 12

- 1 abrasion occasion
- 2 diversion excursion
- 3a conclusion erosion explosion seclusion
- 3b collision decision division provision

21,4 Frequency = 27

-ture Frequency = 27

- 1 capture creature culture feature
- fixture fracture future lecture
- mixture moisture nature pasture
- picture posture puncture rapture
- rupture sculpture structure torture
- venture vulture
- 2 adventure furniture overture seacreature
- signature

Block 22 Frequency = 324

22,1 Frequency = 92

Stress pattern 3B Frequency = 92

| | | | | |
|-----------|----------------|-------------|-----------------|---------------|
| <u>1a</u> | absolute | advertise | aggravate | altitude |
| | antelope | antiquate | appetite | atmosphere |
| | attitude | calculate | candidate | centipede |
| | concentrate | cultivate | envelope (N) | estimate (Vb) |
| | fascinate | illustrate | indicate | institute |
| | irrigate | multitude | sensitize | substitute |
| | vaccinate | ventilate | vestibule | |
| <u>1b</u> | alternate (Vb) | artichoke | circulate | fertilize |
| | fumigate | harmonize | hibernate | hurricane |
| | longitude | marmalade | merchandise (P) | organize |
| | persecute | porcupine | turpentine | vaporize |
| <u>2</u> | certify | crucify | dignified | fortify |
| | justify | lullaby | magnify | multiply |
| | mummify | notify | occupy | purify |
| | terrify | testify | | |
| <u>3</u> | alphabet | architect | autograph | Bethlehem |
| | caravan | consequence | daffodil | difficult |
| | frankinsense | paragraph | parallel | penmanship |
| | photograph | subtrahend | thermostat | |
| <u>4</u> | anteroom | astronaut | barbecue | buffalo |
| | bungalow | celluloid | chickadee | corduroy |
| | dinosaur | indigo | marigold | mistletoe |
| | nowadays | parakeet | peekaboo | piccolo |
| | somersault | uniform | universe | yesterday |

22,2 Frequency = 124

Stress pattern 3A Frequency = 124

| | | | | |
|----------|-----------------------|---------------|------------|-----------|
| <u>1</u> | alleg ¹ ry | ancestry | artery | battery |
| | balcony | century | charity | company |
| | contrary | cranberry | currency | dignity |
| | gallery | industry | mercury | mulberry |
| | pharmacy | primary | prophecy | possibly |
| | purity | rickety | rotary | summary |
| | tendency | terribly | | |
| <u>2</u> | article | barnacle | capable | constable |
| | follicle | horrible | icicle | multiple |
| | notable | particle | pinnacle | possible |
| | rectangle | sensible | spectacle | terrible |
| | vehicle | | | |
| <u>3</u> | admiral | cannibal | carnival | funeral |
| | hospital | interval | numeral | principal |
| | sentinel | terminal | vertical | |
| <u>4</u> | ancestor | carpenter | character | circular |
| | corridor | cucumber | emperor | juniper |
| | barrier | messenger | milliner | officer |
| | passenger | singular | | |
| <u>5</u> | algebra | Florida | formula | gondola |
| | orchestra | taffeta | | |
| <u>6</u> | abdomen (P-AS) | badminton (P) | bulletin | cardigan |
| | cinnamon | coconut | emphasis | garrison |
| | invalid (P-AS) | manikin | moccasin | octopus |
| | paraffin | Puritan | stewardess | vitamin |
| | wilderness | | | |

22,2 (con't)

7

| | | | |
|------------|------------|------------|-----------|
| accident | afterward | afterwards | applicant |
| consonant | continent | excellent | immigrant |
| implement | impudent | incident | innocent |
| instrument | ornament | pharmacist | permanent |
| sentiment | supplement | testament | |

8

| | | | |
|--------------|------------|---------------|--------------|
| accurate | adjective | alternate(Aj) | ambulance |
| armistice | confidence | countenance | estimate (N) |
| juvenile (P) | opposite | ordinance | orphanage |
| talkative | transitive | | |

22,3 Frequency = 89

Stress pattern 30 Frequency = 89

| | | | | |
|----------|-------------|-------------|------------|------------|
| <u>1</u> | Alaska | alfalfa | angora | antenna |
| | bandanna | bermudas | chinchilla | crayola |
| | diploma | gorilla | saliva | vánilla |
| | veranda | victrola | umbrella | |
| <u>2</u> | another | December | disaster | divisor |
| | embroider | encounter | endeavor | November |
| | October | remainder | semester | September |
| | suspenders | together | | |
| <u>3</u> | Chicago | contralto | flamingo | kimomo |
| | memento | pimento | potato | tobacco |
| | tomato | tornado | torpedo | volcano |
| <u>4</u> | abandon | accustomed | appendix | asbestos |
| | bronchitis | domestic | elastic | efêctric |
| | embarrass | fantàstic | galoshes | gigantic |
| | historic | horizon | indignant | interpret |
| | majestic | molasses | narcissus | opposum |
| | opponent | persimmon | romantic | toboggan |
| | transpèrent | | | |
| <u>5</u> | apostle | apparel | assemble | èternal |
| | illegal | immortal | orchestral | utensil |
| <u>6</u> | adhesive | advantage | assembly | canary |
| | committee | dependence | determine | employee |
| | infertile | intestine | percentage | productive |
| | remembrance | resemblance | tomorrow | |

22,4 Frequency = 19

Stress pattern 3D Frequency = 19

| | | | | |
|----------|-----------------|-----------|------------|------------|
| <u>1</u> | absentee | buccaneer | chimpanzee | engineer |
| | halloween(P) | velveteen | | |
| <u>2</u> | bayonet (AS) | clarinet | contradict | correspond |
| | entertain | impolite | intercede | interfere |
| | interrupt | introduce | kangaroo | mandolin |
| | mayonnaise (AS) | | | |

Fourth-Year Word List

Frequency = 1129

Block 23 Frequency = 151

23.1 Frequency = 72

A29 Frequency = 29

| | | | | |
|-----------|------------|-------------|----------|------------|
| <u>1a</u> | baste | haste | paste | taste |
| | waste | | | |
| <u>1b</u> | distaste | hasten | hastily | hasty |
| | pasteboard | paster | pastry | tasteless |
| | tasty | wastebasket | | |
| <u>2</u> | arrange | arrangement | change | changeable |
| | exchange | mange | mangy | range |
| | ranger | strange | stranger | |
| <u>3</u> | angel | danger | endanger | |

A24 Frequency = 43

| | | | | |
|----------|------------|------------|-----------|-----------|
| <u>1</u> | wad | wan | wand | want |
| | wash | wasp | watch | |
| <u>2</u> | swamp | swan | swat | |
| <u>3</u> | flyswatter | swampy | swatter | unwashed |
| | washer | Washington | wash tub | watchdog |
| | watchmaker | watchman | whitewash | |
| <u>4</u> | swallow | waffle | wallet | wallop |
| | walnut | walrus | wampum | wander |
| | wanderer | water | waterer | waterfall |
| | waterway | watery | wigwam | |
| <u>5</u> | quality | quantity | squab | squad |
| | squander | squash | squat | |

23,2 Frequency = 48

135 Frequency = 21

| | | | | |
|------------|----------|-----------|------------|-----------|
| <u>l</u> a | mi | ski | ti | |
| <u>l</u> b | confetti | Hopi | | |
| <u>2</u> | chlorine | marine | quarentine | ravine |
| | sardine | submarine | tangerine | vaccine |
| <u>3</u> | casino | farina | mobile(P) | petticoat |
| | pinochle | police | policeman | polliwog |

125 Frequency = 27

| | | | | |
|----------|-----------|-------------|------------|-------------|
| <u>1</u> | billion | communion | million | millionaire |
| | onion | pavillion | rebellion | reunion |
| | stallion | union | | |
| <u>2</u> | behavior | junior | savior | senior |
| <u>3</u> | ammonia | begonia | magnolia | petunia |
| <u>4</u> | interview | review | view | viewer |
| <u>5</u> | brilliant | convenience | convenient | genial(P) |
| | peculiar | | | |

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 = 223

24,1 Frequency = 50

Four-syllable compounds Frequency = 11

| | | | |
|----------------|----------------|---------------|--------------|
| brother-in-law | dictatorship | forget-me-not | huckleberry |
| jack-o-lantern | merry-go-round | morning-glory | relationship |
| San Francisco | sister-in-law | United States | |

-ing Frequency = 7

| | | | |
|----------------|---------------|-------------|-------------|
| appetizing | embarrassing | magnifying | merrymaking |
| self-governing | understanding | undertaking | |

-y Frequency = 1

difficulty

-er Frequency = 6

| | | | |
|--------------|------------|------------|----------|
| discoverer | fertilizer | multiplier | overseer |
| photographer | undertaker | | |

-or Frequency = 8

| | | | |
|------------|------------|------------|------------|
| captivator | cultivator | incubator | insulator |
| numerator | percolator | supervisor | ventilator |

-en Frequency = 1

undertaken

-ed Frequency = 2

| | |
|-------------|--------------|
| complicated | disappointed |
|-------------|--------------|

-ly Frequency = 14

| | | | | |
|----------|----------------|--------------|-------------|-------------|
| <u>1</u> | apparently | contentedly | disorderly | exceedingly |
| | excitedly | extensively | intimately | personally |
| | practically(P) | respectively | unwillingly | |
| <u>2</u> | respectfully | successfully | wonderfully | |

24,2 Frequency = 89

E35 Frequency = 38

| | | | | |
|-----------|-------------|-----------|---------------|-------------|
| <u>1a</u> | exit | exile | Texas | |
| <u>1b</u> | exercise | execute | flexible | Mexican |
| | Mexico | | | |
| <u>2a</u> | clever | crevice | devil | ever |
| | levee | lever | level | levy |
| | never | seven | seventh | sever |
| <u>2b</u> | devastate | eleven | eleventh | evergreen |
| | evermore | evidence | evident | forever |
| | however | revenue | seventeen | seventeenth |
| | seventy | whenever | whichever | |
| <u>2c</u> | everlasting | evidently | Beverly Hills | |

138 Frequency = 22

| | | | | |
|-----------|------------|------------|----------|-------------|
| <u>2a</u> | civic | civics | civil | forgive |
| | give | giver | live(Vb) | liver |
| | quiver | river | rivet | shive |
| | sliver | shortlived | shrivel | vivid |
| <u>2b</u> | civilize | cod-liver | deliver | forgiveness |
| | liverwurst | privilege | | |

24,2 (con't) A38 Frequency = 21

| | | | | |
|-----------|-----------|-------------|-----------|-----------|
| <u>1a</u> | axis | axie | taxi | |
| <u>1b</u> | saxophone | taxicab | | |
| <u>2a</u> | cavern | gravel | have | ravel |
| | savage | travail (P) | tavern | travel |
| | travels | | | |
| <u>2b</u> | avalanche | avenue | cavity | davenport |
| | lavender | navigate | scavenger | |

038 Frequency = 8

| | | | | |
|-----------|---------|------------|---------|--|
| <u>1a</u> | foxy | oxen | | |
| <u>2a</u> | novel | proverb | + ince | |
| <u>2b</u> | poverty | providence | novelty | |

24.3 Frequency = 67

127 Frequency = 19

| | | | | |
|-----------|-----------|-------------------------------|-----------|----------|
| <u>1a</u> | magic | magical | panic | |
| <u>1b</u> | chromatic | dramatic | dramatics | mechanic |
| | volcanic | | | |
| <u>2a</u> | habit | inhabit | | |
| <u>3</u> | banish | radish | Spanish | vanish |
| <u>4</u> | acid | invalid (meaning "not valid") | | rapid |
| | rapidly | rapids | | |

128 Frequency = 17

| | | | | |
|-----------|----------|---------|------------|-------|
| <u>1a</u> | clinic | mimic | | |
| <u>1b</u> | artistic | pacific | terrific | |
| <u>2a</u> | limit | spirit | spirited | visit |
| | visitor | | | |
| <u>2b</u> | prohibit | solicit | | |
| <u>3</u> | diminish | finish | unfinished | |
| <u>4</u> | frigid | timid | | |

129 Frequency = 2

| | | | | |
|-----------|--------|---------|--|--|
| <u>1a</u> | physic | physics | | |
|-----------|--------|---------|--|--|

24,3 (con't) 028 Frequency = 20

| | | | | |
|-----------|-----------|-----------|---------|--------|
| <u>1a</u> | chronic | comical | frolic | phonic |
| | phonics | tonic | topic | tropic |
| | tropical | | | |
| <u>1b</u> | alcoholic | atomic | masonic | |
| <u>2a</u> | profit | profiteer | vomit | |
| <u>2b</u> | deposit | | | |
| <u>3</u> | abolish | astonish | polish | |
| <u>4</u> | solid | | | |

E28 Frequency = 9

| | | | | |
|-----------|----------|-----------|----------|--|
| <u>1a</u> | relic | | | |
| <u>1b</u> | athletic | athletics | pathetic | |
| <u>2a</u> | credit | | | |
| <u>2b</u> | editor | inherit | | |
| <u>3</u> | cherish | perish | | |

24,4 Frequency = 17

General primary vowel Rule 27 Frequency = 17

| | | | | |
|----------|------------|-----------|-----------|------------|
| <u>1</u> | humanity | humidity | morality | prosperity |
| | rapidity | vitality | | |
| <u>2</u> | activity | captivity | hostility | nobility |
| | | | | |
| <u>3</u> | ability | capacity | facility | posterity |
| | simplicity | stability | vicinity | |

Block 25 Frequency = 240

25,i Frequency = 61

-tion Frequency = 61

- 1a interjection intersection reconstruction
- 1b arbitration circulation compensation constipation
- constitution contribution corporation cultivation
- distribution fascination illustration institution
- irrigation navigation numeration vaccination
- ventilation
- 2a annexation cancellation confirmation information
- transportation
- 2b admiration combination conservation consolation
- conversation exploration inspiration invitation
- observation perspiration respiration
- 3 composition disposition exposition opposition
- 4 application exclamation explanation inflammation
- introduction occupation
- 5 definition preparation preposition preservation
- recitation reputation reservation resolution
- revelation revolution
- 6 ammunition aviation constellation jubilation
- jurisdiction

25,2 Frequency = 63

126 Frequency = 30

| | | | | |
|-----------|------------|-----------|----------|---------|
| <u>1a</u> | dial | diet | giant | liar |
| | lion | riot | | |
| <u>1b</u> | briar | friar | quiet | science |
| | trial | triumph | | |
| <u>2a</u> | quietly | quietness | sealion | sundial |
| | triumphant | | | |
| <u>2b</u> | diagram | diary | iodine | liable |
| | pioneer | scientist | triangle | viaduct |
| | violate | violence | violent | violet |
| | violin | | | |

Y26 Frequency = 2

cyanide hyena

U26 Frequency = 11

| | | | | |
|----------|--------|-------------|-----------|---------|
| <u>1</u> | bluish | bruin | duet | fluid |
| | ruin | suet | truant | |
| <u>2</u> | annual | annually(P) | influence | suicide |

E26 Frequency = 15

| | | | | |
|----------|----------|------------|----------|-------------|
| <u>1</u> | create | meow | | |
| <u>2</u> | area | cereal | creation | idea |
| | leotard | meteor | museum | peony |
| | preamble | prearrange | reaction | rodeo(AS,P) |
| | theater | | | |

25,2 (con't) 026 Frequency = 3

poem poet poetry

A26 Frequency = 2

quity mosaic

25,3 Frequency = 37

136 Frequency = 35

1 fiord

2 curio folio polio portfolio

radio studio

3 calcium helium medium premium

radium stadium

4 alien audience barrier champion

chariot foliage Indian lariat

maniac oriole period radiant

radius ruffian serial terrier

viola warrior zinnia zodiac

5 championship hurriedly

436 Frequency = 2

embryo Tokyo

25,4 Frequency = 33

A12 Frequency = 18

| | | | | |
|----------|-----------|------------|------------|---------------|
| <u>1</u> | able | cable | cradle | fable |
| | gable | ladle | maple | sable |
| | stable | staple | table | |
| <u>2</u> | enable | tablecloth | tablespoon | tablespoonful |
| | 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 = 46

E14 Frequency = 20

| | | | | |
|----------|-------------|------------|---------|----------|
| <u>1</u> | reflect | reflection | refrain | refresh |
| | refreshment | regret | replace | reply |
| | retract | retreat | | |
| <u>2</u> | cathedral | declare | decline | decrease |
| | deprive | eclipse | Negro | secret |
| | secretly | zebra | | |

114 Frequency = 9

| | | | | |
|--|---------|-----------|------------|------------|
| | biplane | library | microphone | microscope |
| | migrate | migration | nitrate | tigress |
| | vibrate | | | |

Y14 Frequency = 4

| | | | | |
|--|---------|---------|---------|----------|
| | cyclone | cypress | hydrant | hydrogen |
|--|---------|---------|---------|----------|

A14 Frequency = 6

| | | | | |
|--|--------------|--------|-----------|-----------|
| | April | apron | fragrance | patriotic |
| | patronize(P) | sacred | | |

O14 Frequency = 4

| | | | | |
|--|------|------|----------|---------|
| | okra | only | proclaim | program |
|--|------|------|----------|---------|

U14 Frequency = 3

| | | | | |
|--|--------------|-----------|-----------|--|
| | duplicate(P) | lubricate | nutrition | |
|--|--------------|-----------|-----------|--|

Block 26 Frequency = 311

26,1 Frequency = 37

-able Frequency = 19

- 1 accountable agreeable available comfortable (P)
- dependable enjoyable favorable obtainable
- profitable reasonable remarkable respectable
- 2 noticeable serviceable
- 3 adorable desirable excusable valuable (P)
- 4 reliable

-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 = 35

IE17 Frequency = 12

| | | | | |
|----------|--------|---------|--------|-------------------|
| <u>1</u> | birdie | brownie | cookie | KT die |
| | laddie | lassie | | |
| <u>2</u> | caddie | collie | hippie | kewpie |
| | mashie | prairie | | |

EY17 Frequency = 23

| | | | | |
|----------|------------|----------|-----------|-------------|
| <u>1</u> | mousey | pulley | | |
| <u>2</u> | alley | barley | chimney | donkey |
| | galley | hockey | honey | jockey |
| | money | monkey | parley | parsley |
| | trolley | turkey | valley | volley |
| <u>3</u> | honeybee | honeydew | honeymoon | honeysuckle |
| | volleyball | | | |

26,3 Frequency = 10

AI17 Frequency = 10

| | | | |
|-----------|----------|----------|--------------|
| bargain | captain | certain | certainly |
| curtain | fountain | mountain | mountainside |
| uncertain | villain | | |

26,4 Frequency = 18

EA33 Frequency = 18

| | | | | |
|-----------|------------|-----------|-------------|--------|
| <u>1b</u> | earn | earth | | |
| <u>2b</u> | heard | learn | pearl | search |
| | yearn | | | |
| <u>4a</u> | hearse | | | |
| <u>6a</u> | earthquake | earthworm | searchlight | |
| <u>6b</u> | pearly | | | |
| <u>7a</u> | early | earnest | earthling | |
| <u>7c</u> | rehearse | | | |
| <u>8b</u> | earnestly | rehearsal | | |

26,5 Frequency = 54

IE12 Frequency = 39

| | | | | |
|-----------|------------|--------------|-------------|---------|
| <u>2b</u> | chief | pier | thief | |
| <u>4a</u> | field | fiend | niece | piece |
| | shield | siege | yield | |
| <u>4b</u> | brief | grief | shriek | |
| <u>5a</u> | grieve | priest | | |
| <u>5b</u> | fierce | pierce | | |
| <u>6a</u> | briefcase | cornfield | crosspiece | |
| <u>6b</u> | chiefly | fielder | fiercely | |
| <u>7c</u> | achieve | apiece | belief | believe |
| | cashier | chieftain | frontier | hygiene |
| | relief | relieve | wiener | |
| <u>7a</u> | cornfield | makebelieve | | |
| <u>3b</u> | disbelieve | left-fielder | out-fielder | |

26,5 Letter E110 Frequency = 15

| | | | | |
|-----------|------------|-------------|----------|-------------|
| <u>2b</u> | sheik | | | |
| <u>4a</u> | weird | seize | | |
| <u>7a</u> | either (P) | | | |
| <u>7c</u> | caffeine | ceiling | conceit | deceit |
| | deceive | neither (P) | perceive | protein (P) |
| | receive | | | |
| <u>8b</u> | receiver | deceitful | | |

26,6 Frequency = 28

EY10 Frequency = 9

| | | | |
|-----------|-----------|---------|-----|
| <u>2a</u> | hey | they | why |
| <u>3b</u> | grey | prey | |
| <u>6a</u> | greyhound | | |
| <u>7b</u> | obey | | |
| <u>8b</u> | surveyor | disobey | |

E120 Frequency = 19

| | | | | |
|----------|------------|----------|--------------|-------------|
| <u>1</u> | neigh | sleigh | weigh | |
| <u>2</u> | eight | freight | weight | |
| <u>3</u> | reign | reins | vein | |
| <u>4</u> | bobsleigh | eighteen | eighteenth | eight |
| | eighty | neighbor | neighborhood | neighboring |
| | overweight | reindeer | | |

26,7 Frequency = 121

-ous Frequency = 38

| | | | | |
|----------|-------------|-------------|-------------|--------------|
| <u>1</u> | dangerous | humorous | joyous | marvelous |
| | mountainous | poisonous | prosperous | |
| <u>2</u> | adventurous | famous | grievous | nervous |
| | porous | | | |
| <u>3</u> | furious | industrious | injurious | mysterious |
| | studious | various | victorious | |
| <u>4</u> | monstrous | wondrous | | |
| <u>5</u> | courteous | curious | enormous | jealous |
| | numerous | obvious | previous | rebellious , |
| | serious | tedious | treacherous | tremendous |
| <u>6</u> | furiously | jealousy | joyously | previously |
| | seriously | | | |

0031 Frequency = 26

| | | | | |
|------------|----------------|--------------|-------------|---------|
| <u>2b</u> | touch | young | | |
| <u>6a</u> | touchdown | | | |
| <u>6b</u> | touched | touching | | |
| <u>7c</u> | country | couple | courage | cousin |
| | double | doublet | flourish | journal |
| | journey | nourish | southern | trouble |
| | youngster | | | |
| <u>8a</u> | double-cross | crosscountry | troublesome | |
| <u>8b</u> | discourage | | | |
| <u>9c</u> | courier | encourage | tambourine | |
| <u>10b</u> | discouragement | | | |

Block 27 Frequency = 204

27,1 Frequency = 19

un- Frequency = 8

| | | | | |
|----------|-------------|-------------|------------|--------------|
| <u>1</u> | uncivilized | unconnected | unexpected | unlimited |
| <u>2</u> | uneventful | unimportant | unmerciful | unsuccessful |

in- Frequency = 6

| | | | | |
|--|-------------|-------------|--------------|--------------|
| | inattention | inattentive | inconvenient | independence |
| | independent | indigestion | | |

dis- Frequency = 3

| | | | |
|--|---------------|--------------|------------|
| | disappearance | disinfectant | disqualify |
|--|---------------|--------------|------------|

mis- Frequency = 2

| | | |
|--|---------------|---------------|
| | misunderstand | misunderstood |
|--|---------------|---------------|

27,2 Frequency = 69

Stress pattern 4A Frequency = 59

| | | | | |
|-----------|-----------------|-------------|---------------|--------------|
| <u>1a</u> | Arabia | bacteria | diphtheria(P) | malaria |
| <u>1b</u> | adverbial | centennial | colonial | congenial |
| | imperial | industrial | material | memorial |
| | perennial | | | |
| <u>1c</u> | appropriate(Aj) | immediate | librarian | |
| <u>2</u> | aquarium | geranium | gymnasium | linoleum |
| | petroleum | | | |
| <u>3a</u> | exterior | inferior | interior | superior |
| <u>3b</u> | ambassador | proprietor | rectangular | triangular |
| <u>3c</u> | artillery | dispensary | distillery | |
| <u>4</u> | emergency | necessity | society | transparency |
| | variety | | | |
| <u>5</u> | coincidence | equivalent | experience | intelligence |
| | intelligent | obedience | obedient | |
| <u>6</u> | impossible | inflammable | invincible | responsible |
| <u>7</u> | aluminum | arithmetic | asparagus | declarative |
| | diversify | extravagant | identical | intransitive |
| | Jerusalem | peninsula | receptacle | |

Stress pattern 4B Frequency = 10

| | | | | |
|----------|-------------|-------------|-------------|-------------|
| <u>1</u> | abbreviate | assassinate | communicate | inaugurate |
| | incorporate | interrogate | intoxicate | investigate |
| <u>2</u> | identify | insecticide | | |

27,3 Frequency = 23

Stress pattern 4C Frequency = 23

| | | | | |
|----------|--------------|--------------|--------------|----------------|
| <u>1</u> | automatic | economics(P) | pancreatic | prehistoric |
| | scientific | supersonic | sympathetic | systematic |
| <u>2</u> | antitoxin | Arizona | carbohydrate | correspondence |
| | fundamental | horizontal | incandescent | influenza |
| | interference | interurban | laryngitis | locomotive |
| | Mississippi | multicolored | tonsillitis | |

27,4 Frequency = 14

Stress pattern 4D Frequency = 14

| | | | | |
|----------|-----------|--------------|--------------|-------------|
| <u>1</u> | customary | ordinary | stationary | temporary |
| <u>2</u> | 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 = 72

E32 Frequency = 49

| | | | | |
|-----------|---------------|-----------------|------------|----------------|
| <u>1a</u> | bakery | bravery | every | grocery (P) |
| | livery | mystery | nursery | robbery |
| | scenery | shrubbery | silvery | slavery |
| | slippery | | | |
| <u>1b</u> | conference | difference | different | reverence |
| | reverent | | | |
| <u>1c</u> | evening | fattening | offering | |
| <u>1d</u> | average | bachelor | beverage | desperate |
| | interest | jeweler | jewelry | opera |
| | pickerel | porcelain | several | temperate |
| | traveler | vaudeville | | |
| <u>2</u> | desparately | everyday | everything | groceryman (P) |
| | indifferent | interesting | | |
| <u>3</u> | circumference | deliberate (Aj) | delivery | discovery |
| | embroidery | perfumery | recovery | refinery |

032 Frequency = 13

| | | | | |
|-----------|-----------------|----------------|----------|-----------|
| <u>1a</u> | factory | hickory | history | ivory |
| | victory | | | |
| <u>1b</u> | Catholic | corporal | favorite | sophomore |
| <u>2</u> | comfortably (P) | elaborate (Aj) | | |
| <u>3</u> | laboratory | satisfactory | | |

27,6 (cc) (1) A32

Frequency = 7

1 boundary diamond diaper separate (Aj)
2 elementary frantically Niagara Falls

132

Frequency = 3

1 capital cardinal
2 cardinal

Section III

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. (See Volume I, Section II, for further comments on the sequencing of irregularly-spelled words.)

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 → [ɔ]. The irregular grapheme units are underlined; e.g., do, to.

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. See Cronnell (1969b) for discussion of the introduction of irregularly-spelled words in beginning reading instruction.

Recommended Order of Instruction for Irregularly-Spelled Words in First Year

Frequency = 33

Block 1

1.1

115 a a

115 i i

1.3

510 s as is

1.5

610 a bass (in music)

1.6

810 i hi

has his

11 o

do to

5.1 o to

Block 2

21 ee been

21 ee bye dye eye

ee

ee eve

Recommended Order of Instruction for Irregularly Spelled Words in Second Year

frequency = 110

Block 5

5,1

Compounds

w → w / nd → windmill

o → o into o onto

Block 6

6,1

III are → ar are

III cardinal numbers:

irregular one [wʌn]
two [tu]

regular by FY rules: four seven eight

(regular by present rules: three five six
nine ten)

6,2

III e → e ere

ere → er were

Block 7

7,1

III o → o once

6,

6,

III a → a granda(P) granda(P)
(also n → n, d → d, a → a)

Block 9

9,2

E21 th → [θ] / __er: ether panther

I21 t → [tɪ]: T-shirt

Block 10

10,1

E17 o → [ɔ]: swollen

o → [ɪ]: women

A17 o → [ʊ]: woman

e → [e]: mesa

O17 ordinal numbers:

irregular. e → [ɪ] / __CV: second
i → [aɪ]: ninth

regular by FY rules: fourth seventh eighth

(regular by present rules first third

fifth sixth tenth)

10,2

F17 i → [ɪ] / __nd: windy

a → [ɪ] any

th → [ɪ]: worthy

u → [ɪ]: bury

e → [ɪ]: pretty

EE22 c → [ɪ] / __C: muscle

10,4

F11 s → [ʃ]: insure sure surely

A25 oward → [tɔ:rd]

12,3

12,3 u → ʊ: cuckoo

12,3 oo → u:: blood blooded bloody

 flood

oo → ɔ: / ɪr: door doorstep doorway

 floor indoor

ye → g: / u:: goodbye

Block 13

13,1

13,1 u → ɪ / v: improve move

 prove

f → ɪ: of

h → ɪ: wholesome

ne → ɪ: someone

l → ɪ: somewhat

ere → ɪ: somewhere

13,1 u → ʊ: sugar

13,2

13,2 a → ɪ / ll: shall

z → ɪ: waltz

13,2 o → ɪ: / ɜ: begone golf gone

13,3

13,3 o → ɪ / st: almost (also all → al)

 host most mostly

 post postal postman

 postman

13,3 four

o → /__l control holster patrol

o → /__s gross

o → /__th both

31 or 14

a → cleanse cleanser clumsy

cosmos husband muslin

pansy plasma Thursday

wisdom

a → /__l false

Block 16

16,1

AI10 ai → [ɪ]: again against said
 ai → [e]: plaid
 ai → [ay]: kaiak

16,2

OUIO oo → [o]: outdoor
 oo → [ɔ]: bloodhound

16,3

OEIO oe → [u]: canoe horseshoe shoe shoehorn
 shoelace shoestring snowshoe
 OAIO oa → [ɔ]: abroad broad broadcast
 broadcloth broadway

16,4

AWIO er → [r]: drawer
 AUIO au → [ɛi]: aunt(P) aunty(P)
 ɛ → [ɛ]: Santa Claus

16,6

UEIO ue → u [u]: truth truthful
 ue → ∅, ng → [ŋ]: tongue
 ɥ → [z]: Tuesday
 EWIO ew → [ɔ]: sew sewer
 eu → [(y)u]: Europe grandeur neutral

Block 18

13,1

E13 e → [i] / __CV.

| | | | |
|--------------------|-----------------|------------------|--------------------|
| dec <u>ade</u> | del <u>uge</u> | her <u>ald</u> | her <u>on</u> |
| leg <u>end</u> | le <u>mon</u> | le <u>monade</u> | me <u>dal</u> |
| me <u>lon</u> | me <u>nace</u> | me <u>tal</u> | pe <u>dal</u> |
| per <u>il</u> | pe <u>tal</u> | pre <u>face</u> | re <u>bel</u> (N) |
| re <u>cord</u> (N) | re <u>fuge</u> | se <u>cond</u> | se <u>condhand</u> |
| se <u>nate</u> | she <u>riff</u> | te <u>nant</u> | |

e → {i} / __ch V: recharge

n → [ɲ]: señor (P) (also e → [e]: senor)

o → [u]: remove

O13 o → [ɔ] / __CV

| | | |
|--------------------------------|------------------|------------------|
| an <u>ybody</u> (also a → [ɪ]) | bo <u>dily</u> | bo <u>dy</u> |
| co <u>net</u> | co <u>py</u> | mo <u>del</u> |
| no <u>body</u> | o <u>live</u> | pro <u>cess</u> |
| pro <u>per</u> | pro <u>perly</u> | ro <u>bin</u> |
| vo <u>lume</u> | | so <u>mebody</u> |

oe → [ɔ]: overshoe

A13 a → [ɛ] / __CV

| | | | |
|----------------|-----------------------------------|--------------------|-----------------|
| ag <u>ate</u> | at <u>om</u> | ba <u>boon</u> (P) | ba <u>lance</u> |
| ca <u>bin</u> | ca <u>fe</u> (also e → [e] / __#) | | ca <u>mel</u> |
| cha <u>pel</u> | da <u>mage</u> | dra <u>gon</u> | fra <u>gile</u> |
| ta <u>lone</u> | gra <u>nite</u> | La <u>tin</u> | ma <u>dam</u> |
| ca <u>lio</u> | ma <u>nage</u> | ma <u>nager</u> | pa <u>lace</u> |

18,1 (cont.)

| | | | |
|-------------------------|--------|-----------|------------|
| panel | patent | planet | salad |
| satin | Saturn | shadow | snapdragon |
| strata | taboo | talent | talented |
| trapeze (P) | wagon | wagonload | |
| vacuum (also uu → [və]) | valor | value | |
| a → [a]: amen | drama | lava | llama |
| plaza | | | |

113 i → [ɪ] / __CV:

| | | | |
|------------------|---------|------------|-----------|
| city | figure | image | lion |
| liquid | lizard | minute (N) | minuteman |
| primer | pity | sinew | spigot |
| spinach | tribute | vigor | widow |
| lizard | | | |
| iron → [ˈaɪrən]: | iron | flatiron | |

113 u → [ʊ] / __CV

rh → [r]: rhubarb

15,

120 a → [eɪ] / __V

| | | | |
|-----------------|--------------------------------|----------|----------|
| abuse (N) | aside | basis | bison |
| close (Adj) | closely | crusade | crusader |
| excuse | excuse (N) | geese | mason |
| nuisance | promise (also o → [ɔɪ] / __CV) | purpose | |
| sausage | usage | use (N) | useful |
| useless | vise | | |
| also oi → [ɔɪ]: | porpoise | tortoise | |

18,2

v → [V] / __CV

| | | | |
|-------------------|-------------------|----------------------|--------------------|
| ch <u>is</u> e | clo <u>s</u> e | de <u>s</u> ert (N) | pr <u>i</u> son |
| pr <u>i</u> soner | pr <u>e</u> sence | pr <u>e</u> sent (N) | pr <u>e</u> sently |
| ri <u>s</u> e | ro <u>s</u> in | vis <u>i</u> t | |

o → [ɔ]: lose whose (also wh → [h])

o → [ɒ]: bosom (P)

u → [ɪ]: business (also i → ∅) busily busy

ɪ → [eɪ] / __[ɪ]: enclose inclose

ss → [z]: dessert dissolve possess scissors

521 s → [z] / ea__e: disease displese ease

plese tease

s → [z] / ou__e: arouse house (Vb) rouse

s → [z] / oo__e: chose

a → [ɪ] / __CV: papoose

18,3

022 g + aq → nge carriage marriage

18,4

025 all → al [ɔɪ] also

ere → nowhere

u → (ɪ) / __#

flu neuu (also e → [i] / __CV)

Block 19

19,1

-ment a → [ɪ] / __CV: magement
 ue → u [yu]: argument
-ive s → [ɪ] /V__V: absive
-ness ue → u [u]: truthfulness

19,2

124 + GH10

all → al [ɔɪ]. aright
eye → [aɪ]: eysight
o → [ɔɪ] / __CV: copyright

GH10

gh → [g] /:__: ghost ghostly
gh → [f]; au → [ɔ:]: draght laugh laughingly
 laugh'ter

H20 ah → [ɔ] / __#: ah bah hurrah
 rah rajah (also a → [a]) yah

eh → [e], [ɛ]: eh
o → [ɔ] / __CV: homage honest honestly
 honor

19,3

k.20 oo → [o]: doorknob
ow → [ɔ]: knowledge

19,3 (cont) G20 i → [i] / __gn#: ensign

u → [u] / __gn#: cologne

W20 u → Ø / __gn#: ansuer sword

19,4

B20 b → Ø / __t: debt doubt doubtful doubtless

i → [ay]: climb

u → [u]: combu

u → [u]: tomu

19,5

T20 ould → [u]: could should would

a → [a] / __la: alumond calum palum

l → Ø: Lincolun soluder

colonel → [i + ɔrnel]

T20 t → Ø: chestut mortguage

out → [u]: deput

eut → [u]: ballut buffut valet (also a → [a] / __CV)

19,6

G20 i → [i] / __CV: guinea quitar

u → Ø: disquise

u → [w] / ...gu: jaguar (also a → [a] / __CV) languuage

penquin

u → [w]: persuade

uy → [y]: buy buyer guy

u → [a] / __: languue pluaque roquue

20,2 (con't) CH31

ache → [æk]. ache backache earache
toothache stomachache
v → [V] / __CV: chemist monarch → monarchy
 scholar

n → [ŋ] / __ch: anchor

i → [ay]: Christ

t → Ø: Christmas

ch → [kwaɪr]: choir

ch → [ʃ]: chamois (also a → [æ] / __CV; ois → [i])

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 → [ɜ]: father forefather grandfather stepfather

th → [θ]: clothing (also ɔ → [o] / __thV) fathom heathen

smooth smoothl swarthy

clothes → [ˈkloʊz]: clothes clothesbasket clothesline

clothespin underclothes

th → Ø: osthus

Block 21

21,1

dis- o → [ɔ] / __CV: dishonest dishonor

re- o → [ɔ] / __CV: remodel

21,2

-tion i → [ɪ] / __tion: addition condition edition

partition position

a → [ɑ] / __tional: natal ratal

21,3

-sion i → [ɪ] / __CV: vision

21,4

-ture a → [ɑ] / __CV: statare nataral

Block 22

22,1

Stress pattern 3B

V → [Ṽ] / __CV

| | | | |
|-------------------------|---|---|---|
| <u>a</u> nc <u>o</u> te | <u>a</u> qu <u>e</u> duct | bo <u>o</u> l <u>o</u> g <u>o</u> l <u>o</u> g <u>o</u> l | cal <u>o</u> g <u>o</u> |
| cele <u>o</u> brate | crit <u>o</u> l <u>o</u> g <u>o</u> l <u>o</u> g <u>o</u> l | cro <u>o</u> cod <u>o</u> l <u>o</u> g <u>o</u> l | de <u>o</u> corate |
| ded <u>o</u> cate | dem <u>o</u> crat | dem <u>o</u> nstrat <u>o</u> e | div <u>o</u> id <u>o</u> |
| dom <u>o</u> inate | dom <u>o</u> no | dram <u>o</u> mat <u>o</u> l <u>o</u> g <u>o</u> l | el <u>o</u> vat <u>o</u> e |
| gen <u>o</u> erate | grat <u>o</u> itud <u>o</u> e | hem <u>o</u> sp <u>o</u> l <u>o</u> g <u>o</u> l | hes <u>o</u> itat <u>o</u> e |
| hol <u>o</u> iday | im <u>o</u> itat <u>o</u> e | ker <u>o</u> sen <u>o</u> e | lat <u>o</u> itud <u>o</u> e |
| man <u>o</u> uvre | man <u>o</u> script | rev <u>o</u> l <u>o</u> ut <u>o</u> l <u>o</u> g <u>o</u> l | mod <u>o</u> erat <u>o</u> e |
| mod <u>o</u> ify | nom <u>o</u> inate | oper <u>o</u> at <u>o</u> e | pac <u>o</u> l <u>o</u> g <u>o</u> l |
| pen <u>o</u> trate | popul <u>o</u> at <u>o</u> e | rat <u>o</u> l <u>o</u> g <u>o</u> l | re <u>o</u> gn <u>o</u> l <u>o</u> g <u>o</u> l |

conu

regulate ridicule rustic saturate
 remate (Vb) retrieve right sphere telephone
 telegraph telephone tele cone tele gram
 telegraph vigilance valence ne
 su → /s/ /vu paradise parasite parag l
 ch → tch parachute
 n → /n/ /uu night ingale
 o → /o/ alcohol
 u → /u/ almond
 u → /u/ /vu, ac → /a/ catalan
 ae → /e/ aeroplane
 au → /o/ auerkraut
 reservoir → /r/ (u) r → (P)

con

con

con

con(u) (P, Vb) annal anter con fat
 calendar calendar calendar calendar
 capital capitol capitol capitol
 capital capitol capitol capitol

22,2 (cont'd)

| | | | |
|-----------|-----------|--------------|-----------|
| miracle | misery | moderate (A) | monitor |
| accident | negative | pelican | platform |
| policy | popular | positive | predicate |
| president | primitive | probable | probably |
| prominent | property | regiment | request |
| regular | relative | remedy | residence |
| resident | senator | similar | skeleton |
| specimen | tapestry | tenement | vanity |
| vinegar | visible | | |

e → [i] / __CV; e → [i] / __: recipe

re → [e] / __: massacre

a → [ɔ] / __: marshmallow

s → [z] / V__V: fuselage (P) pleurisy (also eu → [y])

s → [z], p → [b] / __b: raspberry

22,3

Stress pattern 30

v → [v̄] / __CV.

| | | | |
|---------------|----------|------------|----------|
| abacus (P,AS) | alpaca | banana | compete |
| consider | continue | contribute | develop |
| distribute | enamel | exquisite | imagine |
| imprison | improper | pajamas | rehearse |
| septano | | | |

e → [ɛ] / __: adobe corate (P)

also a → [a]: karate serape tarach

ow → [u]: acknowledge

d → [θ] / n__j: adjacent

all → [ɔ] almighty

22,3 (cont'd) u + v instinctive acquaintance
u + v distinct distinguish
u + v u + v bologna
u + v u + v / LV lieutenant

22,4

str. pattern 30'

v + v / LV

u + v concrete matinee also ce + u recollect

u + v concrete referee refugee volunteer

u + v u + v peride

u + v / LV picturesque

u + v / LV Heine (P)

Recommended Order of Instruction for Irregularly-Spelled
Words in Fourth Year

Frequency = 384

Block 23

23,1

A29 a · [e] / __CC: chamber

A24 ea · [e]: breakwater

23,2

135 V · [Ṽ] / __CV: chili gasoline khaki (also kh · [k])

magazine vasoline

ɔ · [ɔ] /V __Ṽ valise

ue · Ø /g __#: fatigue

que · [k] / __: antique unique

qu · [k]: mesquite mosquito

u · [w] suite

ch · [ʃ] machine

gh · [ŋ]: spaghetti

zz · [t:] pizza

ll · [ɹ] tortilla

ai · [ay] Hawaii

125 h · Ø dahlia (or a · [e], h · Ø dahlia)

shion · [ʃi:] cushion fashion old-fashioned

p · Ø /: __C (C ≠ r, i), eu · [u] pneumonia

V · [Ṽ] / __CV companion dominion familiar

opinon spaniel Virginia

24,1 (cont'd) -or V - [Ū] / __CV: gelevator generator operator
 regulator separator seculator
 -ly V - [Ū] / __CV defineitely moderately regularly
b - Ø / __t : undoubetedly

24,3

E38 a - [ə]: whatever
ere - [ɛ]: wherever
who - [hɔ]: whoever

U28 u - [ʌ] / __C ish: punish punishment

24,4

General primary vowel Rule 27

u - [ʊ] / __C ity (rule U13): community security
o - [ɔ] / __C ity (rule O21) authority (also au - [ɔ]) majority
e - [ɛ] (Rule A24) equalerity

Block 25

25,1

-tion V - [Ū] / __CV benediction celebration decoration
 dediconation demonstration elevation
 generation hesitation imitation
 legislation operation popopulation
 regulation resurrection salutation
 sanitation satisfaction separation
 vegetation
i - [ɪ] / __tion exhibition expedition
 reconition (also e - [ɛ] / __CV)

25,2

- 126 ue · Ø /g__#: dialogue
- U26 V · [Ǟ] /__CV: genuine manual minuet
oy · [i]: buoy (or buoy · [boy])
- E26 V · [Ǟ] /__CV: linear stereo
- O26 e · [ɛ] /__CV: heroine

25,3

- 136 V · [Ǟ] /__CV: idiot patio piano
pianist(P)
- o · [ɔ] /__thV, th : [ó]: clothier
- ae · [ɛ]: aerial

25,4

' A12, 012

- re · [ar] /C__#: acre ogre
- Y12 y · [ɪ] /__Cl#: bicycle tricycle

25,5

- E14 e · [ɛ] /__C^r V: leprechaun petrify
pueblo (also u · [w]) recreation
represent
- 114 ɪ · Ø isle island
- 014 o · [ɑ] /__C^r V: proclamation progress
- 114 u · [ə] /__CIV: public publication publish
publisher quintuplet republic
- A14 a · [ɛ] /__C^r V: acrobat acrobatic Africa
apricot(P) declaration establish
sacrifice

Block 26

26,1

-able V · [Ǟ] / __CV: honorable manageable miserable
preferable

shion · [ʃən]: fashionable

-ment V · [Ǟ] / __C(l)V: development establishment

-al V · [Ǟ] / __CV: additional mechanical

-ist o · [a] / __CV: pathologist

26,2

IE17 a · [ɜ] / __CV: calarie

au · [ɜ]: auntie (P)

o · [ɜ] / __v: movie

EY17 s · [z]: jersey

o · [a] / __r: attorney

26,3

A117 ea · [e]; i · [ɪ] / __CV: Great Britain

26,4

EA33 s · [s] / V__V: research

ea · [ɜ] in unstressed syllables.

pageant (also a · [ɜ] / __CV)

sergeant (also e · [ɜ])

vengeance

26,5

IE12 ie · [ɪ]: handkerchief (also d · [∅] (P) kerchief

mischief sieve

s · [s]: rabies series

26,7 (con't) OU33 ou - [ʊ]: boulevard

g - [ʒ]: rouge

OU34 gh - [tʃ]: cough trough (or gh - [ɔ])

Block 27

27,1

in- v - [ṽ] / __CV: incredible invisible

dis- a - [ɛ] / __CV: dissatisfied

27,2

Stress pattern 4A

v - [ṽ] / __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 meridian
monogamy monopoly municipal
original particular perimeter
philosopher political
rhinoceros (also rh - [r]) ridiculous
speedometer thermometer(P)
v - [ṽ] / __C_ v: biography democracy geography
republican stenographer
ɹ - [ɹ]; s - [s] / V__V: chrysanthemum

- 27.6 (cont.) A32
- | | | | |
|------------------------|------------------|----------|------------|
| v → \check{v} / __CV | salary | separate | separately |
| ɹ → ʃ, ɹ → Ø | sarsaparilla (P) | | |
| ɑ → ɜ | caramel (P) | | |
| 132 a → ɪ / __CV | family | | |

Additional irregularly spelled words

(See also Section V)

- | | | |
|------------------------|--|-----------------------------|
| ɛə → ɛ | bureau | plateau (also a → ɔ / __CV) |
| ɛə → y | beautiful | beautifully (P) beautify |
| | beauty | |
| eo → | in unstressed syllables: <u>dun</u> geon | |
| | tuncheon | pigeon (also ɹ → ɹ / __CV) |
| | surgeon | |
| ee → | people | |
| eo → | leopard | |
| et → | fallet | buffet |
| ɛ → / / unstressed __V | exact | exalt |
| | exam | example |
| | exhaust | exhibit |
| | existence | |
| | also v → \check{v} / __CV: | examination |
| | examine | executive |
| ie → ɪ | sundae | |
| aa → ɔ | bazaar | |
| au → Ø | restaurant | |
| monsieur → mɒs, ʒjɔ̃ | | |
| aisle → ɛɪ | | |

Section II

Sequenced Proper Names

In Cronnell (1969a) 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 III for irregularly-spelled words.

Sequences of 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 Eli

S10 Stan

1,4

J10 Dan Sid

E15 Ed Les Len Ned Ted

1,5

M10 Matt Nil Milt Pam Sam Tim

B10 Bill Ben

D15 Bud Dud

1,6

R10 Rob Ron

H10 Hill

G15 Bob Don Dot Tod Tom

Block 2

2,2

TH11 Beth Smith

Block 3

3,1

EE19 Lee

Block 4

4,1

F10 Fran Fred

W10 Will

4,2

K10 Ken Kent

H20 Hank Frank

C12 Cal Mac Scot

CK10 Dick Mack Nick Rick

4,3

G12 Glen Glenn Green Greg Glen

4,4

J10 Jack Jan Jeff Jill Jim Jon

X10 Max Rex

4,5

V10 Bev Van Vic

Sequenced Proper Names for Second Year

Frequency = 159

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 | Ferb | Sherm | | | |

9,2

| | | | | | |
|-----|--------|---------|--------|--|--|
| E21 | Albert | Herbert | Miller | | |
| U21 | Turner | Wilbur | | | |
| A21 | Arthur | Parker | | | |

Sequenced Proper Names for Second Year

Frequency = 159

Block 6

6,1

| | | | | | |
|-----|------|------|------|------|------|
| All | Dale | Dave | Jake | Jane | Kate |
| Ill | Mike | | | | |

6,2

| | | | | | |
|-----|------|------|-------|--|--|
| Oll | Hope | | | | |
| Ull | June | | | | |
| Ell | Eve | Pete | Steve | | |

Block 7

7,1

| | | | | | |
|-----|-------|-------|--|--|--|
| Cll | Bruce | Grace | | | |
| Gll | Gene | | | | |

Block 9

9,1

| | | | | | | |
|-----|------|------|-------|-------|------|------|
| A21 | Art | Bart | Carl | Clark | Karl | Mark |
| U21 | Burt | Curt | Kurt | | | |
| I21 | Kirk | | | | | |
| E21 | Bert | Ferb | 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 | Edward | Ella | Emma |
| | Herman | Linda | Lora | Marsha | 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

024 Ross

Block 14

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

16,3

OE10 Joe

OA10 Joan

16,4

AW10 Lawrence

AU10 Laura Maureen Maurice Paul Paula Saul

16,5

OY10 Boyd Joy Joyce Lloyd Roy

16,6

UE10 Sue

EW10 Andrew Lew Lewis Stewart

Block 17

17,2

5 Charles James Jones

Block 18

18,1

E13 Edit Elaine Eva Peter Vera

O13 Lola Roland Tony

A13 Ada Amy David Davis Hazel Jacob Mabel Nathan

I12 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

18,4

025 Jo Margo

Block 19

19,2

H20 John Johnny Johnson Sarah

Block 20

20,2

PH10 Phil Phillip Ralph Randolph(P) Rudolph(P)
CH31 Chris

Block 22

22,2

Stress pattern 3A

Allison Anderson Anthony Benjamin Christopher
Jacqueline Jennifer Jessica Peterson

22,3

Stress pattern 3C

Dolores Loretta Melissa Priscilla Rebecca Roberta

Sequenced Proper Names for Fourth Year

Frequency = 103

Block 23

23,1

A24

Wanda

23,2

135

Anita

Bernice

Christine

Josephine (P)

Lucille

Pauline

Rita

Toni

125

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

126

Brian

026

Stuart

E26

Andrea

Beatrice

Leon

Theodore

026

Joanna

Joanne

Joel

Lois

25,3

136

Cynthia

Gloria

Harriet

Lillian

Margon

Sylvia

Victoria

Vivian

25,5

014

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 | | |
| EY17 | Audrey | Dudley | Harvey | Jeffrey | Mickey |
| | Rodney | Shirley | Sidney | Stanley | |

26,4

EA33 Earl

26,5

E110 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 → [ə] / __CV: Donald Robert Roger Ponald

A13 a → [æ] / __CV: Adam Alan Alex Alice Janet Janice

a → [ɔ]: Lana

a → [e] / __chV: Rachel

18,4

O25 u → [u] / __#: Stu

Block 19

19,2

GH10 u → [yu]: Hugh

19,5

L20 l → Ø: Malcolm

Block 20

20,2

PH10 e → [i] / __phV; ph → [v]: Stephen

CH31 ch → [ʃ]: Charlene Charlotte Michelle

20,3

TH12 th → [t]: Ester Thomas (also o → [ɪ] / __CV) Thompson

tth → [θ]: Matthew

Block 22

22,1

Stress pattern 3B

$V \rightarrow [\overset{\vee}{V}] / _ _ CV$ Abigail Isabel

22,2

Stress pattern 3A

$V \rightarrow [\overset{\vee}{V}] / _ _ CV$: Emily Gregory Jonathan Madeline
 Oliver Pamela Timothy

22,3

Stress pattern 3C

$\underline{th} \rightarrow [t]; \underline{s} \rightarrow [s] / V _ V$: Theresa

Recommended Order of Instruction for
Irregularly-Spelled Proper Names in Fourth Year

Frequency = 23

Block 23

23,2

136 l o s t e / __ CV

e / __ CV Geraldine

135 v / __ CV Daniel Virginia

Block 25

25,2

126 d / __ CV Diana Diane

126 s / __ CV Samuel

25,5

114 d / __ CV Debra

114 p / __ CV Patrick

Block 26

26,2

111 re in unstressed syllables Marie

a / __ CV Natalie Valerie

26,4

133 ea in unstressed syllables

Eleanor (also e / __ CV) Jeanette

26,5

112 ee Eileen

Block 2/

27,0

Eff e → /__CV Efferick

Uff e → /__CV Ufferah

27,2

Stress pattern 4A

v → /__CV Elizabeth Nathaniel

Penclope (also e → /__CV)

27,3

Stress pattern 4C

a → /__CV alexander

Miscellaneous

cia → Marcia Patricia (also e → /__CV)

u → Ruth

i → /__CV, ae → Michael

ae → the

ge → leand

ge → septem

Section V

Unsequenced Additional Words

Frequency = 245

Eighty-one words are only sequenced in Sections II to IV of this guide. There are also 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, in the 1970). Irregularly-spelled words are included, with the irregular spelling noted, to include mostly exceptions to general primary vowel rules.

Section V - 114 Words - Frequency = 108

Words of syllable length in the five- and six-syllable words have been sequenced in blocks 1-27. The only exception is increased syllable length.

Section V - 114 Words - Frequency = 99

Five-Syllable Words with Affixes - Frequency = 62

| | | | |
|-------|----------------|-----------------|------------------|
| -tion | civilization | administration | association(P) |
| | civilization | communication | confederation |
| | cooperation | denomination | emancipation |
| | evaporation | imagination | inauguration |
| | incorporation | interrogation | intoxication |
| | investigation | multiplication | organization |
| | recommendation | representation | |
| -ly | absolutely | accidentally(P) | affectionately |
| | approximately | continually(P) | exceptionally(P) |
| | moderately | industriously | 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 |
| | periodical | transcontinental | |
| un- | uncomfortable (P) | unnecessary | unreasonable |
| | unsanitary | | |
| dis- | disagreeable | disobedience | |
| other: | abolitionist | confectionary | inequality |
| | indivisible | revolutionize | |

b. Other five-syllable words Frequency = 37

| | | |
|------------------|--------------------|----------------|
| amplitheater | anniversary | appendicitis |
| archipelago | auditorium | cafeteria |
| cock-a-doodle-do | delicatessen | denominator |
| entymology | evaporated | exclamation |
| hippopotamus | hydroelectric | mainstay |
| inimitable | innumerable | inseparable |
| intermediate | interrogative | irreproachable |
| manufactory | metropolitan | miscellaneous |
| observatory | patriotism | Pennsylvania |
| preliminary | refrigerator | representative |
| sanatorium | superintendent (P) | theological |
| terminology | zephyr | zodiac |
| zoogulary | | |

2. Six-syllable words Frequency = 9

| | | |
|-------------------|------------------|----------------|
| capitalization | characteristic | encyclopedia |
| extraor | oleomargarine | revolutionary |
| satisfactorily(P) | unconstitutional | unsatisfactory |

b. Palatalizations Frequency = 137

Palatalizations, although relatively common, are rather complex (see Cronnell, 1969a, pp. 33-35). The three most frequent palatalizations--tion, ston, ture--are found in Section II (21,2; 21,3; 21,4; 25,1). The remaining palatalizations are listed below.

1. a. -cial → [ʃəl]:

| | | | |
|------------|------------|--------------|---------------|
| artificial | beneficial | commercial | especially(P) |
| financial | judicial | official | social |
| special | specialist | specially(P) | specialty |

b. -sure → [ʃɔːr]:

| | | | |
|----------|----------|-----------|-------------|
| exposure | leisure | measure | measurement |
| pleasure | treasure | treasurer | treasury |

c. -ssure → [ʃɔːr]:

| | |
|--------------------|----------|
| assure (or [ʃɔːr]) | pressure |
|--------------------|----------|

d. -tune → [ʃɛːt] (or [ʃɛːn]):

| | | | |
|------------|---------------|---------|----------------|
| fortunate | fortunately | fortune | fortune-teller |
| misfortune | unfortunately | | |

2. a. -sia → [ʃiːə]:

| | |
|------|--------|
| Asia | Persia |
|------|--------|

b. -sian → [ʃiːən]:

| |
|----------|
| artesian |
|----------|

c. -ssian → [ʃiːən]:

| |
|---------|
| Russian |
|---------|

d. -cian → [ʃiːən]:

| | | |
|-------------|----------|-----------|
| electrician | magician | physician |
| politician | | |

- e. -cient · [ʃənt]: ancient efficient sufficient
sufficiently
- f. -science · [ʃəns]: conscience
- g. -ciency · [ʃənsi]: efficiciency proficiciency
- h. -tient · [ʃənt]: impatient impatiently patient
patiently quotient
- i. -tience · [ʃəns]: patience
- j. -tia · [ʃə]: militia
- k. -tial · [ʃəl]: essential initial partial
residential
- l. -dial · [ʃəl]: cordial cordially
3. a. -tious · [ʃəs]: ambitious cautious cautiously
nutritious superstitious
- b. -teous · [ʃəs]: righteous
- c. -gious · [ʃəs]: contagious religious
- d. -geous · [ʃəs]: advantageous courageous goreous
outrageous
- e. -cious · [ʃəs]: delicious ferocious gracious
precious spacious suspicious
vicious
- f. -scious · [ʃəs]: conscious unconscious
- g. -xious · [ʃəs]: anxious anxiously

4. a. -ci- · [ʃi]: appreciate appreciation associate
- b. -ti- · [ʃi]: initiate
- c. -su- · [ʒu]: unusual unusually usual
- d. -tu- · [ʃu]: actual actually (P) congratulate
 congratulation eventually (P) mature
 punctual punctuality punctuation
 spiritual (P) statuary statue
- e. -tur(e) · [ʃər]: natural (P)
 naturally (P) saturate unnatural (P)
- f. -teur · [ʃər]: amateur pasteurization pasteurize
- g. -du- · [ju] (or [jə]): educate educated education
 educational gradual graduate
 graduation individual pendulum
 schedule situate situation
5. a. -tian · [ʃən] Christian
- b. -xion · [kʃən]: complexion complexioned
- c. -cean · [ʃən]: Atlantic Ocean ocean Pacific Ocean
-ce · [ʃi]: oceanic
- d. -gion · [jən]: legion region religion
- e. -dier · [jər]: soldier
- f. -cier · [ʃər]: glacier
- g. -zier · [ʒər]: glazier
- h. -sier · [ʒər]: hosiery
- i. -ssue · [ʃu]: issue tissue
- j. -sur- · [ʃər]: insurance

- k. -xur- → [kʰer]. luxury
- l. -cies → [ʃiz]. species
- m. -tio → [ʃo]. ratio

Errata and Addenda

After this report was completed, some errors were discovered, which, however, should not substantially affect the usefulness of the materials. In addition, a number of words were inadvertently omitted; these should be checked by program developers to add words necessary for reading.

Words sequenced twice

The following words were sequenced twice; they are listed below, in sequence, with the position from which they should be deleted. In parentheses, is the position at which they do and should properly occur.

| | | | |
|---------------|-------------------|---------------|--------------------------|
| 8,2 | A16 | accent | (20,4 CC11) |
| 8,2 | A16 | object (N) | (10,1 E17) |
| 10,1 | A17 | public | (ir: 25,5 U14) |
| 10,1 | A17 | publish | (ir 25,5 U14) |
| 10,1 | E17 | midget | (14,1) |
| 10,4 | A16 | accept | (20,4 CC11) |
| 19,1 | <u>-ance/-ant</u> | acceptance | (20,4 CC11) |
| 27,6 | A32 | separate (Aj) | (ir 27,6 A32) |
| Section V, B4 | | natural | (ir, 21,4 <u>-ture</u>) |

Words improperly included

The following words were mistakenly included, although not in the Berdiansky et al. (1969) lexicon. They should be deleted (unless desired by program developers).

| | | |
|---------|----------------|------------|
| 17,3 | -er | retainer |
| 24,1 | -en | undertaken |
| 24,3 | Y28 | physics |
| in 11,1 | NG10 | lengthen |
| in 27,2 | SP4 | monogamy |

additions

The following words were mistakenly omitted from the Berdiansky et al. (1969) lexicon. They should be added there and sequenced as follows.

| | | |
|---------|------|------|
| coolie | 26,2 | IE17 |
| freeway | 12,1 | AY10 |

in irregularly spelled words, Section III of this volume.

Addenda

The following words were in the Berdiansky et al. (1967) lexicon, but were not sequenced. They should be placed in the sequence as follows.

| | | | | |
|------|---------------|--------------|-------------|-------------|
| 2,1 | SH10 | shop | | |
| 5,1 | | big shot | | |
| 6,1 | AI1 | scrape | | |
| 9,2 | E21 | ferment (N) | | |
| 10,1 | E17 | bidden | | |
| 10,2 | Y17 | angry | | |
| 10,4 | E21 | ferment (Vb) | | |
| 10,5 | E17 | extent | | |
| 11,3 | WH10 | big wheel | | |
| 12,1 | AY10 | today | | |
| 12,2 | EA11 | appear | beard | beaver |
| | | speak | | |
| | E431 | meant | | |
| 12,4 | OW11 | shallow | | |
| 13,3 | O24 | throng | | |
| 14,1 | | fringe | hinge | lacrosse |
| | | plunge | sponge | |
| 15,2 | | divine | export | golden |
| | | report | instinct | rainful |
| | | provoke | hortage | vista |
| 16,1 | AI10 | pigtail | rainbow | rainstorm |
| | | trailer | training | |
| 16,3 | OA10 | coat | | |
| 17,1 | | boll weevil | counterpane | pall bearer |
| 17,2 | <u>-er</u> | server | | |
| | <u>-s</u> | pincers | | |
| | <u>-ed</u> | doctored | | |
| 18,1 | E13 | beside | retailer | |
| | O13 | cocoa | | |
| 18,2 | S10 | muse | | |
| 18,4 | O25 | barro | the | |
| 19,1 | <u>-ance/</u> | recondant | retainer | |
| | <u>-ant</u> | | | |

| | | | | |
|------|-----------|---------------|-------------|----------|
| 20,1 | -ful | unhealthful | | |
| 20,3 | TH12 | brotherhood | | |
| 22,1 | SP3B | phonograph | | |
| 22,2 | SP3A | bacterin | compliment | copilot |
| | | practical | popsicle | portable |
| 22,3 | SP3C | heroic | resemble | |
| 22,4 | SP3D | guarantee | | |
| 23,1 | A24 | washbasket | | |
| 23,2 | I35 | handicap | | |
| 24,1 | compounds | self-reliance | | |
| 24,3 | U28 | depositor | | |
| 24,4 | | gravity | prosperity | |
| 25,1 | | proposition | | |
| 25,2 | U26 | duofold | | |
| | O26 | oasis | | |
| 25,3 | I36 | guardian | median | radiator |
| 25,5 | A14 | fragrant | patriot | |
| 26,7 | -ous | glorious | | |
| | OU3T | tournament | | |
| | OU35 | fourteenth | mourning | |
| 27,2 | SP4A | affectionate | parenthesis | |
| 27,6 | E32 | differently | temperature | |

Irregularly-spelled words (Section III)

| | | | | |
|------|-----|-----------|-------------|---------|
| 4,1 | F10 | nana | pa | |
| 10,2 | Y17 | many | | |
| 12,2 | | beefsteak | | |
| 15,1 | | bye-bye | | |
| 15,2 | | forbade | | |
| 17,3 | -ly | heartily | | |
| 18,1 | L13 | very | | |
| | O13 | modern | produce (N) | product |
| | I13 | lily | | |
| 18,2 | S20 | basin | business | |

| | | | | |
|------------|-------|-------------|-------------|-------|
| 19,1 | -ment | improvement | | |
| 19,2 | H20 | on | | |
| 19,3 | G20 | champagne | | |
| 19,6 | U20 | plaque | | |
| after 19,6 | | condemn | damn | |
| 20,2 | CH31 | headache | | |
| 21,2 | | ambition | translation | |
| 21,3 | | precision | | |
| 22,1 | SP3B | monogram | | |
| 22,2 | SP3A | vocative | | |
| 23,2 | I25 | frijoles | | |
| 23,3 | Y15 | rhythm | | |
| | Y13 | typhoid | | |
| 25,1 | | valuation | | |
| 25,5 | 114 | triple | | |
| 26,5 | E110 | serve | | |
| 27,3 | SP4C | apparatus | | |
| after 27,6 | | beau | exactly | exert |
| | | yeoman | | |

Section V

| | | | |
|----|----------------|--------------|---------|
| A1 | enthusiastic | manufacturer | |
| | necessarily | | |
| A2 | responsibility | | |
| B1 | unfortunate | | |
| B4 | gradually | pasteurizer | usually |
| B5 | luxurious | | |

APPENDIX A

Key to Pronunciation and Symbols

Key to Pronunciation

The following phonetic symbols are used to indicate pronunciation. The symbols used in *International Phonetic Alphabet* (1957) are given on the right for reference.

| <u>Symbol</u> | <u>Key words (corresponding graphemes underlined)</u> | <u>Dictionary Symbol</u> |
|---------------|---|--------------------------------|
| Vowels | | |
| [i:] | sc <u>e</u> ne, <u>n</u> eat, <u>s</u> ee, <u>ch</u> ief | i |
| [ɪ] | <u>b</u> it, <u>h</u> idden | i |
| [e] | <u>n</u> ame, <u>d</u> ay, <u>th</u> ey | e |
| [ɛ] | <u>g</u> et, <u>h</u> ead | e |
| [æ] | <u>f</u> at, <u>b</u> ad | æ |
| [ɑ] | <u>h</u> ot, <u>c</u> ar | ɑ |
| [ɔ] | <u>s</u> ong, <u>l</u> oss, <u>ta</u> ught, <u>l</u> awn, <u>t</u> alk, <u>b</u> all, <u>th</u> ought | ɔ |
| [ɒ] | <u>b</u> one, <u>g</u> o, <u>f</u> ork, <u>t</u> oe, <u>b</u> oard, <u>k</u> now | ɒ |
| [ʊ] | <u>put</u> , <u>push</u> , <u>book</u> , <u>could</u> | ʊ |
| [u] | <u>fo</u> od, <u>d</u> ew, <u>t</u> une | u |
| [ʊ] | <u>but</u> , <u>ab</u> ove | (unstressed) ʊ (stressed) u |
| [ɔɪ] | <u>cr</u> y, <u>m</u> ine, <u>d</u> ie | ɔɪ |
| [ɔʊ] | <u>fo</u> und, <u>ow</u> l | ɔʊ |
| [ɔɪ] | <u>bo</u> y, <u>no</u> ise | ɔɪ |

| <u>Symbol</u> | <u>Key words (corresponding graphemes underlined)</u> | <u>Dictionary Symbol</u> |
|---------------|---|--------------------------|
| Consonants | | |
| [t] | <u>b</u> oy, ca <u>b</u> | |
| [ʃ] | <u>ch</u> urch, <u>ch</u> ip, ha <u>ch</u> | |
| [d] | <u>d</u> ead, <u>d</u> o | |
| [f] | <u>f</u> un, <u>f</u> air, <u>off</u> | |
| [g] | <u>g</u> o, <u>g</u> ay, <u>egg</u> | |
| [h] | <u>h</u> ome, <u>h</u> ead | |
| [ʒ] | <u>j</u> udge, <u>g</u> em, <u>a</u> ge | |
| [k] | <u>k</u> ill, <u>k</u> ick, <u>c</u> ome, <u>c</u> at | |
| [l] | <u>l</u> et, <u>l</u> ittle | |
| [m] | <u>m</u> an, ha <u>m</u> | |
| [n] | <u>n</u> o, ha <u>nd</u> | |
| [ŋ] | si <u>ng</u> , si <u>ng</u> le, thi <u>nk</u> | |
| [p] | <u>p</u> ull, tri <u>p</u> | |
| [r] | <u>r</u> ed, fa <u>r</u> | |
| [s] | <u>s</u> ee, <u>i</u> ce, mi <u>ss</u> | |
| [ʒ] | <u>sh</u> e, <u>s</u> ure, <u>i</u> ssue, na <u>ti</u> on, ha <u>sh</u> | |
| [t] | <u>t</u> en, hi <u>t</u> , li <u>k</u> ed | |
| [v] | <u>v</u> ase, lo <u>v</u> e | |
| [w] | <u>w</u> et, lang <u>u</u> age, qu <u>ic</u> k | |
| [j] | <u>y</u> et, <u>y</u> ou | |
| [z] | <u>z</u> oo, la <u>z</u> y, plea <u>s</u> e, wi <u>v</u> es | |
| [ʒ] | vi <u>si</u> on, treas <u>ur</u> e | |
| [θ] | <u>th</u> ing, ba <u>th</u> | |
| [ð] | <u>th</u> em, ba <u>th</u> e | |

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)

∅ = 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 Beldianky, 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 in boys.
- COMPOUND:** a word composed of two (or more) words, e.g., goldfish, house-boat.
- CONSONANT DIGRAPH:** a grapheme unit composed of two or more consonant letters, e.g., th, ck, qu.
- 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 → [ɔd] 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. Since such exceptions were coded "40," the words are sometimes known as "40 words." The term "irregular" refers to exceptions.
- EXEMPLAR:** a word containing a particular spelling-to-sound correspondence.
- GRAPHEME:** a unit of an alphabet, a letter. For English, any of the 26 letters.
- GRAPHEME UNIT:** one or more letters (graphemes) 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.
- IRREGULAR:** see EXCEPTIONS.
- MULTISYLLABLE:** a word of two or more syllables.

PRIMARY VOWEL. a grapheme unit composed of a single vowel letter, i.e.,
a, e, i, o, u, y.

RULES OF CORRESPONDENCE: see SPELLING-TO-SOUND CORRESPONDENCE.

SECONDARY VOWEL. a grapheme unit composed of two (or more) vowel letters,
e.g., ee, oo, ay. also called "vowel digraph."

SILENT LETTER. a letter in a word for which there is no corresponding
sound in the pronunciation of the word (symbolized by Ø). 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
tough, 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., accommodate. Stress is some-
times called accent.

SYLLABLE. a segment of speech containing one vowel sound and optional
consonant sounds. (In addition, certain consonant sounds may be
syllabic).

APPENDIX C

Summary of Rule Sequence

FIRST YEAR

Block 1

- 1,1 N10, NN10, T10, (TT10) , 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

- 2,1 SH10
- 2,2 TH13, TH11

Block 3

- 3,1 EE10, E25
- 3,2 Y19

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 Volume 1 (Section II and in Appendix C) it is noted where exemplars of the parenthesized rules first appear.

Block 4

- 4,1 F10, FF10, W10
- 4,2 K10, N20, C12, CK10
- 4,3 G12
- 4,4 J10, X10, Y10
- 4,5 V10, Z10, ZZ10

SECOND YEAR

Block 5

- 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

- 6,1 E18, A11, I11
- 6,2 O11, U11, E11, EE10 + E18

Block 7

- 7,1 C11, G11
- 7,2 -s, -d, and -ing suffixes; added to words with general primary vowel Rule 11.

Block 8

- 8,1 Compounds with rules in Blocks 5-7
- 8,2 A16, I16, U16, E16, O16 (two-syllable words, first syllable stressed)

Block 9

- 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

- 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

- 11,1 NG10 (two syllables)
- 11,2 CH10, TCH10
- 11,3 WH10
- 11,4 QU10
- 11,5 GG10, CC12
- 11,6 G31

Block 12

- 12,1 AY10
- 12,2 EA11, EA31
- 12,3 OO11, OO12
- 12,4 OW11, OW12

Block 13

- 13,1 O31, U31
- 13,2 A23, O23
- 13,3 I22, O24

Block 14

- 14,1 Stressed VCCe#
- 14,2 Stressed VrCe.
- 14,3 Unstressed VCCe# and VCe#

THIRD YEAR

Block 15

- 15,1 8-9 one-syllable word with first-year rules
- 15,2 8-9 words with second-year rules

Block 16

- 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

- 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

- 18,1 E13, O13, A13, I13, U13
- 18,2 S20, S21
- 18,3 A22
- 18,4 O25

Block 19

- 19,1 Three-syllable words with suffixes: -ment, -or, -ive,
-ness, -ance, -ant
- 19,2 IE11, 124 + GH10, GH10, H20
- 19,3 K20, G20, W20
- 19,4 B20
- 19,5 L20, T20
- 19,6 U20

Block 20

- 20,1 Three-syllable words with suffixes: -v, -ful, -al, -able,
-eth, -less, -ist, -ish
- 20,2 PH10, CH31
- 20,3 TH12
- 20,4 CC11

Block 21

- 21,1 Three-syllable words with prefixes: un-, re-, dis-, in-,
mis-
- 21,2 -tion
- 21,3 -sion
- 21,4 -ture

Block 22

- 22,1 Stress pattern 3B
- 22,2 Stress pattern 3A
- 22,3 Stress pattern 3C
- 22,4 Stress pattern 3D

FOURTH YEAR

Block 23

- 23,1 A29, A24
- 23,2 I35, I25
- 23,3 Y11, Y13, Y15, Y16

Block 24

- 24,1 Four-syllable compounds
Four-syllable words with suffixes: -ing, -y, -er, -or, -en, -ed, -ly
- 24,2 E38, I38, A38, O38
- 24,3 A28, I28, Y28, O28, E28
- 24,4 General primary vowel Rule 27

Block 25

- 25,1 Four-syllable words with -tion
- 25,2 I26, Y26, U26, E26, O26, A26
- 25,3 I36, Y36
- 25,4 A12, I12, Y12, O12, U12
- 25,5 E14, I14, Y14, A14, O14, U14

Block 26

- 26,1 Four-syllable words with suffixes: -able, -ment, -al, -ness,
-ary, -ist
- 26,2 IE17, EY17
- 26,3 A117
- 26,4 EA33
- 26,5 IE12, E110
- 26,6 EY10, E120
- 26,7 -ous, OU31, OU35, OU33, OU34
- 26,8 U131

Block 27

- 27,1 Four-syllable words with prefixes: un-, in-, dis-, mis-
- 27,2 Stress patterns 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, Exemplars, Position in Sequence

Spelling-to-sound correspondences for primary vowels

| <u>Grapheme Unit</u> | <u>Rule</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|-------------|---|------------------------|-----------------------------|
| A | 11 | a → [e] / __Ce- | name, brave | 6,1 |
| | 12 | a → [e] / __Ct ^r e# | acre, stable | 25,4 |
| | 13 | a → [e] / __CV | baby, nature | 18,1 |
| | 14 | a → [e] / __C ^r V | April, fragrant | 25,5 |
| | 15 | a → [æ] / __C(C)# | sat, fast | 1,1 |
| | 16 | a → [æ] / __CC.... | saddle, jacket | 8,2 |
| | 17 | a → [ə], [ɪ] in unstressed syllables | above, final | 10,1 |
| | 21 | a → [ɑ] / __ ^{rC} _{r#} | cart, car | 9,1 |
| | 22 | a → [ɪ], [æ] / __r | vary, marry | 18,3 |
| | 23 | a → [ɪ] / __ $\begin{Bmatrix} lk \\ lt \\ ld \end{Bmatrix}$ | ball, walk, salt, bald | 13,2 |
| | 24 | a → [ɑ], [ɔ] / ^w u__ | wad, squat | 23,1 |
| | 25 | a → [ɔ] / $\begin{Bmatrix} wh \\ w \\ qu \end{Bmatrix}$ __r | wharf, war, quart | 9,3 |

For further description of these rules and of the rule notation, see Berdiansky, Cronnell and Koehler (1969), Cronnell (1971), and Section III of this report. Asterisked rules do not appear in the earlier reports.

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> | |
|----------------------|---------------------|---|--|-------------------------------|------|
| A | 26 | a → [ei] / __ -V | mosa <u>a</u> c | 25,2 | |
| | 27 | a → [i:] / __ C ity | human <u>i</u> ty, capac <u>i</u> ty | 24,4 | |
| | 28 | a → [i:] / __ C $\begin{cases} ic \\ id \\ ish \\ it \end{cases}$ | mag <u>i</u> c, rap <u>i</u> d, rad <u>i</u> sh, hab <u>i</u> t | 24,3 | |
| | 29 | a → [ei] / __ :nge ste# | str <u>a</u> nge, past <u>e</u> | 23,1 | |
| | 32 | a → ∅ | separ <u>a</u> te | 27,6 | |
| | 38 | a → [i:] / __ ^{vV} x(1)V | cav <u>a</u> rn, ax <u>i</u> s, ax <u>a</u> le | 24,2 | |
| | E | 11 | e → [i:] / __ Ce# | sc <u>e</u> ne, her <u>e</u> | 6,2 |
| | | 13 | e → [i:] / __ CV | her <u>e</u> , met <u>e</u> r | 18,1 |
| 14 | | e → [i:] / __ C $\begin{matrix} r \\ \\ V \end{matrix}$ | zeb <u>e</u> ra, decl <u>e</u> are | 25,5 | |
| 15 | | e → [i:] / __ C(C)· | set <u>e</u> , felt <u>e</u> | 1,4 | |
| 16 | | e → [i:] / __ CC.... | edg <u>e</u> , extr <u>a</u> | 8,2 | |
| 17 | | e → [i:], [i:] in unstressed syllables | hidd <u>e</u> n, tal <u>e</u> nt, magn <u>e</u> t | 10,1 | |
| 18 | | e → ∅ / __ | nam <u>e</u> , edg <u>e</u> , immens <u>e</u> , mic <u>e</u> | 6,1 | |
| 19 | | e → ∅ / __ ^s d | arm <u>e</u> d, wiv <u>e</u> s | --- | |
| 21 | | e → [i:] / __ $\begin{matrix} rC \\ r \end{matrix}$ | her <u>d</u> , fath <u>e</u> r | 9,1 | |
| 25 | | e → [i:] / : (C)C__ | w <u>e</u> , sh <u>e</u> | 3,1 | |
| 26 | e → [i:] / __ -V | creat <u>e</u> , me <u>a</u> tw | 25,2 | | |
| 27 | e → [i:] / __ C ity | prosper <u>i</u> ty | 24,4 | | |

Not taught explicitly as a correspondence rule.

| <u>Grapheme</u> | <u>Rule</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|-----------------|-------------|---|--|-----------------------------|
| E | 23 | $e \rightarrow _ / _ C \begin{cases} \text{ish} \\ \text{it} \end{cases}$ | re <u>l</u> ic, che <u>r</u> ish cre <u>d</u> it | 24,3 |
| | 24 | $e \rightarrow _ / _ V$ | differe <u>n</u> ce, <u>l</u> everal | 23,6 |
| | 26 | $e \rightarrow _ / _ \begin{matrix} \text{vV} \\ \text{x(1)V} \end{matrix}$ | cle <u>v</u> er, ex <u>i</u> t | 25,2 |
| I | 11 | $i \rightarrow _ / _ C e$ | fi <u>n</u> e, li <u>k</u> e | 6,1 |
| | 12 | $i \rightarrow _ / _ C \begin{cases} r \\ e \end{cases}$ | ti <u>t</u> le, i <u>d</u> le | 25,4 |
| | 13 | $i \rightarrow _ / _ CV$ | pi <u>l</u> ot, ci <u>d</u> er | 18,1 |
| | 14 | $i \rightarrow _ / _ C \begin{cases} r \\ e \end{cases}$ | mi <u>g</u> rate, i <u>d</u> ly | 25,5 |
| | 15 | $i \rightarrow _ / _ C(C) _$ | si <u>t</u> , mi <u>l</u> k | 1,1 |
| | 16 | $i \rightarrow _ / _ CC \dots$ | hi <u>dd</u> en, li <u>tt</u> le | 7,2 |
| | 17 | $i \rightarrow _ / _ \text{ in unstressed syllables}$ | mi <u>ss</u> ile, offi <u>ce</u> | 12,1 |
| | 21 | $i \rightarrow _ / _ \begin{matrix} rC \\ r_1 \end{matrix}$ | bi <u>r</u> d, si <u>r</u> | 3,1 |
| | 22 | $i \rightarrow _ / _ \begin{cases} \text{nd} \\ \text{ld} \\ \text{gn} \end{cases}$ | fi <u>nd</u> , i <u>ld</u> , si <u>gn</u> | 13,3 |
| | 24 | $i \rightarrow _ / _ gh$ | hi <u>gh</u> , ri <u>gh</u> t | 19,2 |
| O | 5 | $o \rightarrow _ / _ VC$ | mi <u>ll</u> ion, on <u>i</u> on | 23,2 |
| | 6 | $o \rightarrow _ / _ _ V$ | li <u>a</u> r, di <u>e</u> t | 25,2 |
| | 22 | $o \rightarrow _ / _ _ \text{ (st)}$ | hu <u>mp</u> er <u>ty</u> , cap <u>t</u> iv <u>ity</u> | 24,4 |
| | 23 | $o \rightarrow _ / _ \begin{matrix} \text{ic} \\ \text{it} \\ \text{ist} \\ \text{it} \end{matrix}$ | cl <u>in</u> ic, fi <u>nd</u> , fi <u>n</u> ish, fi <u>re</u> t | 24,3 |

| <u>Grapheme Unit</u> | <u>Rule</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|-------------|---|--|-----------------------------|
| 1 | 32 | i → ∅ | aspir <u>i</u> n | 27,6 |
| | 35 | i → | pol <u>i</u> ce, ski <u>i</u> | 23,2 |
| | 36 | i → /__ -V | radio, peri <u>o</u> d | 25,3 |
| | 38 | i → /__ ^v x(1)V | c <u>i</u> vic, r <u>i</u> ver | 24,2 |
| 9 | 11 | o → /__ Ce | h <u>o</u> me, sn <u>o</u> ke | 6,2 |
| | 12 | o → /__ C ^r e | og <u>re</u> , nob <u>le</u> | 25,4 |
| | 13 | o → /__ CV | not <u>i</u> ce, od <u>o</u> r | 18,1 |
| | 14 | o → /__ (C ^r) V | ok <u>ra</u> , on <u>ly</u> | 25,5 |
| | 15 | o → /__ C(C) | lot, lo <u>ck</u> | 1,6 |
| | 16 | o → /__ CC.... | not <u>to</u> , h <u>o</u> ck <u>e</u> y | 8,2 |
| | 17 | o → , , , in unstressed syllables | lot <u>to</u> n, sail <u>o</u> r | 10,1 |
| | 21 | o → , , , /__ t | h <u>o</u> rn, tort <u>o</u> se | 9,1 |
| | 22 | o → /w__ rt | w <u>o</u> rd, w <u>o</u> rth | 9,3 |
| | 23 | o → /__ tC | roll, s <u>o</u> ld, v <u>o</u> lk, b <u>o</u> lt | 13,2 |
| | 24 | o → , , , /__ ^{ng} ^{ss} ^t th ^(a) | off, w <u>o</u> tt <u>er</u> , s <u>o</u> ng, m <u>o</u> ss, lo <u>st</u> , w <u>o</u> th, d <u>o</u> g | 13,3 |
| | 25 | o → /__ | go, not <u>to</u> | 18,4 |
| | 26 | o → /__ -v | po <u>o</u> r | 25,2 |
| | 27 | o → /__ C ^r ^{ng} ^{id} ^{sh} ^{it} | ph <u>o</u> ne, ch <u>ild</u> , p <u>o</u> l <u>it</u> ic <u>ian</u> , p <u>o</u> l <u>it</u> ic <u>ian</u> | 24,3 |

| <u>Grapheme</u> | <u>Rule</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|-----------------|-------------|---------------------------------|--|-----------------------------|
| 1 | 21 | o → | w <u>o</u> n, m <u>o</u> ther, s <u>o</u> me, l <u>o</u> ve | 13,1 |
| 2 | 22 | o → ɔ | s <u>o</u> ph <u>o</u> more, lic <u>o</u> rice | 27,6 |
| 3 | 23 | o → / __ x(t)v | n <u>o</u> vel, <u>o</u> xen | 24,2 |
| 4 | 11 | u → (.)u, / __ Ce | <u>u</u> se, cr <u>u</u> de | 6,2 |
| 5 | 12 | u → (.)u, / __ C ^r e | h <u>u</u> gle | 25,4 |
| 6 | 13 | u → (.)u, / __ CV | <u>u</u> n <u>it</u> , cr <u>u</u> sade | 18,1 |
| 7 | 14 | u → (.)u, / __ C ^r V | h <u>u</u> gler | 25,5 |
| 8 | 15 | u → / __ C(C) | g <u>u</u> m, f <u>u</u> ss | 1,6 |
| 9 | 16 | u → / __ CC... | s <u>u</u> dden, j <u>u</u> stice | 8,2 |
| 10 | 17 | u → , in unstressed syllables | lett <u>u</u> ce, min <u>u</u> te | 10,1 |
| 11 | 24 | u → ø / q __ V | g <u>u</u> est, q <u>u</u> ard | 19,6 |
| 12 | 25 | u → / __ r | f <u>u</u> r, b <u>u</u> rn | 9,1 |
| 13 | 26 | u → (.)u, / __ V | f <u>l</u> uid, r <u>u</u> n | 25,6 |
| 14 | 27 | u → | b <u>u</u> ll, p <u>u</u> sh, p <u>u</u> t | 13,1 |
| 15 | 28 | u → ʌ | natur <u>u</u> | 27,6 |
| 16 | 29 | u → / __ te | rh <u>u</u> me, t <u>u</u> pe | 23,3 |
| 17 | 30 | u → / __ t ^r e | cy <u>u</u> le | 25,4 |
| 18 | 31 | u → (.)u, / __ V | t <u>u</u> rant, pap <u>u</u> rus | 23,3 |
| 19 | 32 | u → / __ C ^r e | cy <u>u</u> clone, c <u>u</u> rt <u>u</u> rt | 25,5 |
| 20 | 33 | u → / __ (t) | q <u>u</u> th, q <u>u</u> m | 23,3 |

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|--|-----------------|-----------------------------|
| Y | 16 | y → [ɪ] / __CC... | system, gypsy | 23,3 |
| | 17 | y → [ɪ], [ɪ] / __# in unstressed syllables | baby, candy | 10,2 |
| | 19 | y → [ay] / __# in stressed syllables | deny, try | 3,2 |
| | 26 | y → [aj] / __-V | hyena | 25,2 |
| | 28 | y → [ɪ] / __C { ic id ish it | physic | 24,3 |
| | 36 | y → [ɪ] / __-V | Tokyo | 25,3 |

Spelling-to-sound correspondences for secondary vowels:

| | | | | |
|----|----|---------------------------------------|-----------------------|------|
| AI | 10 | ai → [e] | stain, rain | 16,1 |
| | 17 | ai → [ə], [ɪ] in unstressed syllables | captain, villain | 20,3 |
| 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 → [e] | each, heat | 12,2 |
| | 31 | ea → [ɛ] | bread, deaf, heaven | 12,2 |
| | 33 | ea → [ə] / __r | earn, search | 26,4 |
| EE | 10 | ee → [i] | bet, feel | 3,1 |
| EI | 10 | ei → [i] | receive, ceiling | 26,5 |
| | 20 | ei → [eɪ] / __ { gn n gh | reign, rein, neighbor | 26,6 |

| <u>Grapheme Unit</u> | <u>Rule</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|-------------|--|---|-----------------------------|
| EW | 10 | ew → [i:] | <u>few</u> , <u>new</u> | 16,6 |
| EY | 10 | ey → [e:] | <u>they</u> , <u>obey</u> | 26,6 |
| | 17 | ey → [ɪ] in unstressed syllables | <u>donkey</u> , <u>money</u> | 26,2 |
| IE | 11 | ie → [e:] / ___ | <u>die</u> , <u>lie</u> | 19,2 |
| | 12 | ie → [ɪ] / ___ | <u>field</u> , <u>grief</u> | 26,5 |
| | 17 | ie → [ɪ] / ___ in unstressed syllables | <u>collie</u> , <u>movie</u> | 26,2 |
| OA | 10 | oa → [o:] | <u>load</u> , <u>boat</u> | 16,3 |
| OE | 10 | oe → [o:] / ___ | <u>hoe</u> , <u>toe</u> | 16,3 |
| OI | 10 | oi → [ɔ:] | <u>noise</u> , <u>join</u> | 16,5 |
| OO | 11 | oo → [u:] | <u>broom</u> , <u>tool</u> | 12,3 |
| | 12 | oo → [o:] | <u>book</u> , <u>wood</u> | 12,3 |
| OU | 10 | ou → [a:] | <u>count</u> , <u>mountain</u> | 16,2 |
| | 31 | ou → [ɔ:] | <u>couple</u> , <u>young</u> | 26,7 |
| | 33 | ou → [y]u | <u>through</u> , <u>group</u> | 26,7 |
| | 34 | ou → [ɔ:] | <u>fought</u> , <u>thought</u> | 26,7 |
| | 35 | ou → [u] | <u>soul</u> , <u>though</u> | 26,7 |
| OW | 11 | ow → [ɔ:] | <u>glow</u> , <u>below</u> , <u>own</u> , <u>bow</u> | 12,4 |
| | 12 | ow → [a:] | <u>now</u> , <u>allow</u> , <u>owl</u> , <u>bow</u> | 12,4 |
| OY | 10 | oy → [ɔ:] | <u>boy</u> , <u>toy</u> | 16,5 |
| UE | 10 | ue → [i:] | <u>blue</u> , <u>argue</u> | 16,5 |
| UI | 11 | ui → [i:] | <u>fruit</u> , <u>juice</u> | 16,6 |
| UR | 11 | ur → [ɜ:] | <u>burnt</u> , <u>burst</u> | 16,7 |

Spelling-to-sound correspondences for consonants

| <u>Grapheme unit</u> | <u>Rule</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|-------------|--|---|-----------------------------|
| B | 10 | b → [b] | <u>boy</u> , <u>cub</u> , <u>number</u> | 1,5 |
| | 20 | b → Ø /m__ | <u>climb</u> , <u>comb</u> | 19,4 |
| BB | 10 | bb → [b] | <u>bubble</u> , <u>blubber</u> | 1,5 (9,2) |
| C | 11 | c → [s] / __ ^e _i y | <u>city</u> , <u>lace</u> , <u>fancy</u> | 7,1 |
| | 12 | c → [tʃ] / __ ^a o u C # | <u>cat</u> , <u>come</u> , <u>cut</u> <u>cream</u> , <u>picnic</u> , <u>scare</u> | 4,2 |
| CC | 11 | cc → [ns] / __ ^e i y | <u>accent</u> , <u>succeed</u> | 20,4 |
| | 12 | cc → [tʃ] / __ ^d u | <u>yucca</u> , <u>account</u> , <u>accuse</u> | 11,5 |
| CH | 10 | ch → [ʃ] | <u>cheap</u> , <u>church</u> | 11,2 |
| | 31 | ch → [tʃ] | <u>ache</u> , <u>school</u> , <u>chord</u> , <u>Christ</u> | 20,2 |
| CK | 10 | ck → [tʃ] | <u>kick</u> , <u>pack</u> | 4,2 |
| D | 10 | d → [d] | <u>dead</u> , <u>needle</u> | 1,4 |
| DD | 10 | dd → [d] | <u>hidden</u> , <u>sudden</u> | 1,4 |
| F | 10 | f → [f] | <u>fat</u> , <u>after</u> | 4,1 |
| FF | 10 | ff → [f] | <u>off</u> , <u>taffy</u> | 4,1 |

The unit in parentheses after some double consonant rules, indicate the first actual occurrence.

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|---|---|-----------------------------|
| G | 11 | $g \rightarrow [j] / \begin{matrix} e \\ _i \\ y \end{matrix}$ | <u>g</u> em, a <u>g</u> e, <u>g</u> in, <u>g</u> ypsy | 7,1 |
| | 12 | $g \rightarrow [g] / \begin{matrix} a \\ o \\ u \\ C \\ \# \end{matrix}$ | <u>g</u> ave, <u>g</u> o, <u>g</u> um, <u>g</u> reen, ba <u>g</u> | 4,3 |
| | 20 | $g \rightarrow \emptyset / \begin{matrix} \# _n \\ _n\# \end{matrix}$ | <u>g</u> naw, si <u>g</u> n | 19,3 |
| | 31 | $g \rightarrow [g]$ | <u>g</u> et, <u>g</u> irl | 11,6 |
| GG | 10 | $gg \rightarrow [g]$ | e <u>gg</u> , wi <u>gg</u> le | 11,5 |
| GH | 10 | $gh \rightarrow \emptyset$ | th <u>ough</u> , ta <u>ught</u> , hi <u>gh</u> | 19,2 |
| H | 10 | $h \rightarrow [h]$ | <u>h</u> ome, a <u>h</u> ead | 1,6 |
| | 20 | $h \rightarrow \emptyset$ | <u>h</u> ajjah, <u>h</u> our | 19,2 |
| J | 10 | $j \rightarrow [j]$ | <u>j</u> oy, <u>j</u> udge | 4,4 |
| K | 10 | $k \rightarrow [k]$ | mi <u>lk</u> , <u>k</u> ill | 4,1 |
| | 20 | $k \rightarrow \emptyset / \# _n$ | <u>k</u> now, <u>k</u> not | 19,3 |
| L | 10 | $l \rightarrow [l]$ | <u>l</u> ike, mi <u>l</u> e | 1,3 |
| | 20 | $l \rightarrow \emptyset / \begin{matrix} o _k \\ a _f \\ a _k \\ a _m \\ a _v \end{matrix}$ | yo <u>lk</u> , fo <u>lk</u> , ha <u>lf</u> , ca <u>lf</u> , wa <u>lk</u> , sta <u>lk</u> , pa <u>lm</u> , ca <u>lm</u> , ca <u>lves</u> , sa <u>lve</u> | 19,5 |
| LE | 22 | $le \rightarrow [al] / C _ \#$ | li <u>ttle</u> , sta <u>ble</u> | 10,2 |
| LL | 10 | $ll \rightarrow [l]$ | bu <u>llet</u> , fi <u>ll</u> | 1,3 |
| M | 10 | $m \rightarrow [m]$ | <u>m</u> an, ca <u>m</u> e | 1,5 |
| MM | 10 | $mm \rightarrow [m]$ | su <u>mm</u> er, ma <u>mm</u> al | 1,5 (9,2) |
| N | 10 | $n \rightarrow [n]$ | <u>n</u> o, <u>n</u> ine, fu <u>n</u> | 1,1 |

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|--|--|-----------------------------|
| N | 20 | $n \rightarrow [ŋ] / \left\{ \begin{array}{l} x \\ k \\ qu \\ y \text{ pronounced } [g] \\ c \text{ pronounced } [k] \end{array} \right\}$ | <u>an</u> xious, <u>th</u> ank, <u>sin</u> k, ban <u>qu</u> et, <u>sin</u> gle, fun <u>g</u> us, <u>fin</u> ger, Lin <u>cn</u> | 4,1 |
| NG | 10 | $ng \rightarrow [ŋ] / _$ | ring, song | 5,5 |
| NN | 10 | $nn \rightarrow [n]$ | inner, funny | 1,1 |
| P | 10 | $p \rightarrow [p]$ | people, pop | 1,2 |
| PP | 10 | $pp \rightarrow [p]$ | pepper, apple | 1,2 (9,2) |
| PH | 10 | $ph \rightarrow [f]$ | phone, photo | 20,2 |
| QU | 10 | $qu \rightarrow [kw]$ | quick, banquet | 11,4 |
| R | 10 | $r \rightarrow [r]$ | run, far | 1,6 |
| RR | 10 | $rr \rightarrow [r]$ | hurry, marriage | 1,6 (9,1) |
| S | 10 | $s \rightarrow [s]$ | sun, fast, horse | 1,3 |
| | 20 | $s \rightarrow [z] / V _ V$ | nose, easy | 18,2 |
| | 21 | $s \rightarrow [s] / \left\{ \begin{array}{l} ou \\ oo \\ ea \\ a \end{array} \right\} _ e$ | house, moose, lease, case | 18,2 |
| | 31 | $s \rightarrow [z] / _ \#$ | trousers, wives, riches | |
| SH | 10 | $sh \rightarrow [ʃ]$ | shoe, rush | 2,1 |
| SS | 10 | $ss \rightarrow [s]$ | mess, missile | 1,3 |

Not explicitly taught as a correspondence rule.

| <u>Grapheme unit</u> | <u>Rule</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|-------------|---|--|-----------------------------|
| t | 10 | t → [t] | <u>ti</u> tle, <u>le</u> t | 2,1 |
| | 20 | t → ∅ / $\begin{cases} s_le\# \\ s_en\# \\ f_en \end{cases}$ | w restle, fast <u>e</u> n, <u>o</u> ften | 19,5 |
| tch | 10 | tch → [tʃ] | <u>ma</u> tch, <u>no</u> tch | 11,2 |
| th | 11 | th → [θ] | <u>th</u> in, ba <u>th</u> | 2,2 |
| | 12 | th → [ð] / $\begin{cases} e \\ er \\ ern \end{cases}$ | ba <u>th</u> e, fa <u>th</u> er, <u>no</u> r <u>th</u> ern | 20,3 |
| | 13 | th → [ð] in pronouns, conjunctions, and function words. | <u>th</u> ey, al <u>th</u> ough, <u>th</u> e | 2,1 |
| tt | 10 | tt → [t] | <u>l</u> itt <u>le</u> , mi <u>tt</u> | 1,1 (9,2) |
| v | 10 | v → [v] | <u>v</u> ase, lo <u>v</u> e | 4,5 |
| w | 10 | w → [w] | <u>w</u> et, be <u>w</u> are | 4,1 |
| | 20 | w → ∅ / $\begin{cases} r \\ r \end{cases}$ | <u>w</u> ren, <u>w</u> rong | 19,3 |
| wh | 10 | wh → [hw] or [w] | <u>w</u> hen, <u>w</u> hether | 11,2 |
| x | 10 | x → [ks] | <u>bo</u> x, <u>ox</u> en | 4,4 |
| y | 10 | y → [j] | <u>y</u> et, be <u>y</u> ond | 4,4 |
| z | 10 | z → [z] | <u>z</u> oo, la <u>z</u> y | 4,5 |
| zz | 10 | zz → [z] | <u>b</u> uzz, fu <u>z</u> zy | 4,5 (10,1) |

APPENDIX E

Number of Words Sequenced for Reading Instruction

| Year | Basic word list (Section II) | Irregularly-spelled words (Section III) | Proper names (Section IV) | Irregularly-spelled proper names (Section IV) | Total |
|---|------------------------------|---|---------------------------|---|-------|
| 1 | 796 | 35 | 65 | --- | 896 |
| 2 | 2286 | 110 | 159 | --- | 2568 |
| 3 | 3210 | 615 | 95 | 37 | 3960 |
| 4 | 1130 | 384 | 103 | 28 | 1644 |
| Total | 7422 | 1142 | 422 | 65 | 9066 |
| Additional unsequenced material (Section V) | | | | | 248 |
| Grand total | | | | | 9311 |

Total number of names: 487

Total number of other words: 8824

(This is approximately 1% less than the total number of words in the lexicon as reported in Berdiansky, Cronnell, and Koehler, 1969. This small difference may be due to (1) human error in compiling lists and frequencies, and (2) correction of errors in the lexicon. A number of additions are found in the Errata and Addenda of the present volume.)

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DESIGN FOR SEQUENCING SPELLING-TO-SOUND CORRESPONDENCES IN MOD 2 READING PROGRAM

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ABSTRACT

From a 9000-word lexicon, a set of spelling-to-sound correspondence rules was developed to systematically organize instruction for beginning reading. With the aid of computer sorting procedures, rules and rule exemplars were sequenced according to criteria of productivity, regularity, generalizability, and phonological equivalence.

This report is in two volumes: Volume I describes sequencing criteria and methodology, and the specific rule sequence; Volume II lists all words (including irregularly-spelled words and proper names), sequenced by and within rules.

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Introduction

The Model 2 Communication Skills Program of the Southwest Regional Laboratory for Educational Research and Development includes a phonics-based reading program founded on a set of spelling-to-sound correspondence rules. The decision to use correspondence rules in teaching the skill of decoding printed words was based principally on the fact that spelling-sound patterns of English words 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 phonics approach is more likely to provide positively transferable elements in decoding new words than a nonphonics approach, and the few irregularities can be learned as sight words. For a detailed discussion of the merits of a phonics approach, and the use of rules of correspondence 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, published preprimer to fourth grade reading materials, published word lists, children's responses to word association tasks, children's TV programs, children's verbal behavior in song and in play, and special interest materials (e.g., clock time information). Approximately 9500

words were selected, they were believed to be in the reception, if not active, vocabulary of the 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 Finlander list were screened and coded by the SWPL staff, and categorized as appropriate to either the 6-7 or 8-9 year-old age group (equivalent to 1-1 and 2-3 grade levels, respectively).

development of spelling-to-sound correspondences (rules)

After specification of the lexicon, the spelling-to-sound correspondences rules were developed based primarily on the work of Venezky (1977, 1979). Venezky's rules were modified somewhat to enable the reader to produce a graphic-to-phonemic representation of the spelling-to-sound relationship by graphing rules. Moreover, the total number of spelling-to-sound correspondences was limited to the 600 or so available words in the SWPL lexicon, and there were no rules to be generated for words not in the lexicon. In order to study a reader's knowledge of the 26 letters of the alphabet, a total of 60 graphing rules were written for the lexicon. The first 26 rules were written for the graphing of the letters (e.g., b, g) but did not include letter combinations (e.g., ch).

Appendix 1. Spelling-to-sound graphing rules

2. consonant digraphs, e.g., two consonant letters, the pronunciation of which can 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 vowel, 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 C. See Berdiansky et al., 1969, Section III, and Carroll, 1971, for a complete description of the correspondences used in this project.) However, for nearly two-thirds (42) of the 69 morphemes, only one correspondence rule was sufficient, for 15 of the morphemes, 1-11, two rules were needed, for the remainder, 7 morphemes, from 3-9, three. It was the primary vowels (a, e, i, o, u, y), with 11-16 correspondence rules apiece, 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.

1. Many correspondences are generalizable across several graphemes. For example, correspondences for final VCe), this is particularly true for primary vowels where there are ten such cases, i.e., ten separate referential letter correspondence rules which can be reduced to ten general vowel correspondences (referred to

- as "general primary vowel rules").
2. Correspondences which were general but complex (e.g., $\underline{a} \rightarrow \text{æ}$, $\underline{e} \rightarrow \text{ɛ}$, $\underline{ɪ} \rightarrow \text{ɪ}$, $\underline{ɔ} \rightarrow \text{ɔ}$, $\underline{ɒ} \rightarrow \text{ɒ}$, $\underline{ɔ} \rightarrow \text{ɔ}$, $\underline{ɪ} \rightarrow \text{ɪ}$) were broken down into several simpler ones (e.g., Rules 011, 012, 013, 014). 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, 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 for one to six single-word pronunciation irregularities per grapheme unit, 35 of the grapheme units have just one pronunciation and 17 have just two (See Appendix II).

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

With the list of correspondences appropriate to the lexicon established, the correspondences for all available words are coded for their component grapheme-unit correspondences. (A code for other information such as the number of syllables and word type were processed by computer and group by correspondences.) For each word appeared in the list of exemplars, the list of its component correspondences to æ , the word in, coded 115,10, is included in the printout both for Rule 115 and N10. Thus the

1. See, for example, the numbering system used for the rules in the Appendix II, p. 115, 116, 117, 118, 119, 120, 121.

computer-generated data, counts were made of the frequency of individual correspondences (e.g., the frequency of 115 = 502 which means that Rule 115 occurs in 502 words). These frequency counts provided information on the usefulness of correspondences and were employed in the sequencing of correspondences.

Statement of Task

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 development of the reading program was the formulation of an instructionally efficient and practical rule sequence.

The major criteria for the fulfillment of this task were as follows:

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 constraint would precede those with environmental constraints.
 - d. separate consonant rules (e.g., MMIO) could be sequenced with their corresponding single consonant rules (e.g., MIO).
3. Rules were placed earlier in the sequence if they occurred in words which originally 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 the following factors: the number of syllables necessary for the natural syntax was to be minimal.

Criteria, limitations and advantages

The following criteria were employed, such as a number of syllables, in the following information and advantages:

1. A well-organized set of phonetic rules enabled the production of identifiable words. Some were not necessarily understood by the child until later in the program.
2. The rules were chosen to properly differentiate sets of lexicon items, and a number of words that could be used for the production of the vocabulary of the typical learner.
3. The rules complied with the regularity of the English letters and syllables, and the child could learn to read and write words.

- 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. Environments are presented as pronunciation environments for many rules for which such is the case. Knowledge of rule environments thus become particularly valuable for decoding words not previously encountered in print.
 7. Systematic simple-to-complex instruction follows from the beginning.
 8. The large number of words permits construction of equivalent, but not identical, word pairs in practice material, reading text, word-track exercises, and criterion-attainment checks.
 9. Grouping words according to common features is a good practice. It is a good example for instruction in focusing on a rule, whether or not that rule is made explicit to the reader. To degree to which the rule will be used for the derivation of new words, instructional cues have yet to be determined.
 10. Correspondence can be put to use in a delayed fashion in a related but not information which must be used in a text-free context.

11. The large pool of available words is classified according to an instructionally practical, accurately detailed system of spelling-to-sound correspondence rules. Such specificity provides a basis for accurately decoding words by applying rules to the pronunciation of words containing those ~~rules~~.

The sequence which will now be described and discussed is the product of numerous and extensive critical analyses and revisions, and is considered sufficiently refined to warrant a moderately large-scale trial of a prototype product employing this sequence.

frequent). This count yielded a ranking of productivity of the various rule combinations. The four rules which constituted the most productive combination were chosen for Unit 1 of Block 1. Four rules were required to produce 10 words, but this seemed to be a manageable learning load.

For the rest of block 1, the remaining rules were sequenced by comparing the number of words introduced after combining each rule with the rules already introduced. Each new rule was sequenced at the point where, of all the remaining rules, that rule made the greatest increase in the number of words introduced.

General Sequencing Criteria

In order to determine a sequence for the rules beyond Block 1, two general criteria were employed: productivity and complexity. The relatively more productive and less complex rules were sequenced first. Productivity was determined by

- 1. the number of words in the lexicon containing that rule,
- 2. the number of syllables of the words in the lexicon containing that rule,
- 3. the number of words in the lexicon containing that rule.

Complexity was also easily definable. The following were the principal criteria used for rule complexity:

- 1. the number of unit pronunciation variabilities. Below are other criteria which were used: grapheme unit size. The grapheme unit is the smallest unit associated with the grapheme unit, the number of graphemes in a unit, its corresponding rule complexity, its syllable pronunciation, the number of words in the lexicon containing that rule, the number of syllables in the words containing that rule, and the number of words in the lexicon containing that rule.

2. Environment complexity. To determine the pronunciation of a grapheme unit in a particular exemplar, how much must be known about the surrounding letters or about the grapheme unit's position within the exemplar (i.e., is it at the beginning, middle, or end of the word?). The more letter-specific the environment must be to determine the pronunciation, the more complex the rule (e.g., Rule A23: $\underline{a} \rightarrow [ɔ] / _ \begin{cases} |l| \\ |k| \\ |t| \\ |d| \end{cases}$ is considered more complex than Rule A15: $\underline{a} \rightarrow [æ] / _ C(C)\#$).
3. Environment similarity. How similar is the rule's environment to the environments of other rules (with different pronunciations) for the same grapheme? A rule is relatively complex if it involves the same environment as another rule specifying a different pronunciation for the same grapheme. For example, the Rules 0011 and 0012 are complex in this regard since 0011 ($\underline{oo} \rightarrow [u]$) shares many environments with 0012 ($\underline{oo} \rightarrow [ɔ]$), so those environments cannot specify the correct pronunciation.
4. Environment generalizability across grapheme units. Does a specific type of environmental constraint apply to more than one grapheme unit? If, for example, a vowel rule involves the same environment recently learned for a different vowel, then that rule is considered less difficult to learn than if it had a unique environment (e.g., general primary vowel rule 11).
5. Functional similarity of the environment. Does the rule expand an environment already learned for the same grapheme-phoneme correspondence? For example, general primary vowel

rules 12, 13, and 14 ($V \rightarrow [\bar{V}] / _C, \left[\begin{smallmatrix} e \\ i \end{smallmatrix} \right] / _CV, / _C \left[\begin{smallmatrix} e \\ i \end{smallmatrix} \right] V$) are considered less complex in this regard if taught after instruction on general primary vowel Rule 11 ($V \rightarrow [\bar{V}] / _Ce$), of which they are extensions or expansions.

6. Phonological generalizability. Does the rule specify the same pronunciation as a rule for a different grapheme? For example, rules K10, C12, and CK10 all have a [k] pronunciation. These correspondences should be easier to remember if the rules are sequenced together. Also, unstressed vowels often share a common [ə] or [ɪ] pronunciation, and so are sequenced together.
7. Similarity of exemplars to those already introduced. Do the words containing the rule have the same number of syllables or the same stress pattern as words previously allowed by the sequence?

Criteria for Unit, Block, and Year Divisions

To enhance its use for developing an instructional program, the list of correspondences was divided into groups called Blocks, and then into units within blocks. 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 could focus on the few, or limited shared characteristics of the rules at any point in the sequence. Such a focus was expected to facilitate the learning of rule generalization which could be applied to the (often previously unencountered) words.

The following criteria for grouping correspondences into units and blocks were used:

1. type of grapheme unit (e.g., primary vowels vs. secondary vowels);
2. generalizability across correspondences (e.g., the vowel classifications VCe, VCC, Vr, schwa),
3. rule frequency;
4. single letters vs. digraphs;
5. phonological similarity or identity (e.g., the [i] and [y] 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 are as follows (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 irregularly spelled words, to a high of 24 rules in Block 1.

The 27 blocks were grouped into four instructional year divisions. The 42 rules were based on manageable learning loads for the corresponding age groups through 3rd grade, rather than on equally dividing the total of 126 rules over 4 years. (First Year: 4 blocks, 44 rules, 36 exemplars; 2nd Year: 4 blocks, 43 rules + suffixes and -VCC exemplars,

Third Year: 8 blocks, 35 rules, plus affixes, "8-9 age 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:

i. First Year involves short vowels, single consonants, geminate consonants (e.g., nn, tt), and consonant digraphs (e.g., sh, th). All of the exemplars are one-syllable, one-vowel words. And instruction covers at least one pronunciation, the most frequent in the SWRL lexicon, for all letters of the alphabet (except g). The consonant digraphs sequenced in First Year are common digraphs 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, in that their one-syllable exemplars each contain only one vowel, with that vowel always pronounced. The consonant, digraph, and other vowel rules specified for first-year instruction are generally of high frequency and/or relatively low complexity.

ii. 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 endings, enter the sequence in Second Year, and instruction covers the vowel stress pattern variation of these two-syllable words. The primary vowel rules involved in Second Year, besides the long-vowel -Vle rule, are the correspondences for vowel lengthening l, short vowels in two-syllable words (-VCC...), and

unstressed vowels having an [ə] or [ɪ] pronunciation. In addition, there are six alternate vowel pronunciation rules introduced which account for high-frequency words considered to be exceptions to the regular short- and long-vowel rules. The secondary vowels entering the sequence here are of high frequency.

3. In Third Year, 8-9 age-level words, as well as 6-7 age-level words, are utilized as exemplars for the rules introduced. The sequence includes the following: three-syllable words; high-frequency primary and secondary vowel rules; low-frequency consonant rules, silent letters; two- and three-syllable verbs 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 silent letters.

5. The Fifth Year sequence, rules, and exemplars

is a computer program sequence for the rules of correspondence, a computer program for applying the sequence to the entire lexicon of the English language. This program was designed to search for the words which contain a rule the words containing that rule

are listed in the Appendix. Their appreciation to the author and the author's appreciation to the computer processing.

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 Volume II, Section II. The program was run separately for the portion of the lexicon designated as appropriate for the 6-7 year-old age group, and again for the 8-9 age-group portion. See appendices F and G for detailed descriptions of the computer programs for the rule sequence.

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 for the entire list to 162.

Also, a parallel study (Cronnell, 1969) was made of spelling-to-sound correspondences in nearly 500 common proper names (primarily first names, and a few high-frequency surnames). These names (both regular and exceptional) were arranged according to the sequence and principles outlined above. Volume II, Section IV lists these sequenced proper names.

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with the following sequential criteria:

1. The order 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 order of subgroup order was established, based on predicted orthographic clarity of rule exemplification in each word group.

2. The order of exemplars used for this order, which is basically the same

order as the ~~word~~ grapheme rules, are:

1. Location of grapheme unit - initial, final, medial, in that order of difficulty,

2. Number of syllables - more syllables mean greater difficulty;
3. Frequency of occurrence - more frequent environment offers more exemplars for exemplification.

4. Within each rule exemplars, within a section were further ordered in the following order of descending preference:

- 1. words containing single consonants,
- 2. words containing separate consonants,
- 3. words containing consonant digraphs,
- 4. words containing consonant clusters,

5. Within each rule exemplars within a section were also ordered in the following order of descending preference

- 1. words containing short vowels,
- 2. words containing long vowels,
- 3. words containing long vowels,

the exemplars containing secondard vowels,

the pronunciation of the vowel(s) in an exemplar will be somewhat affected by the consonant it precedes if that consonant is r, l, or a nasal (n, m, ng).

When there was no criterion for division, or when the number of exemplars for a rule, words were alphabetized. Within each subgroup, words were also alphabetized.

Volume II, section II lists the exemplars for each rule, subgrouped according to the within-rule sequencing criteria described. More specific criteria also utilized are discussed in Volume II, Section I.

Irregular Words

Approximately 10 percent of the one- and two-syllable words in the word lexicon are labeled "irregular" (numbered as a Rule 40). These words have at least one pronunciation or environment which is not accounted for by any of the rules in the program. Such exceptions were grouped together separately from the regular words, but according to the same criteria described above for the regularly-spelled words. For the purpose of computer sequence processing, the irregular rule(s) within each word group was designated as equivalent to its earliest appearing regular counterpart (e.g., #40 = A15). In addition, each word was not included until all the regular correspondences within it had appeared in the lexicon. Thus, the irregular words were computer sequenced according to their earliest possible occurrence. In general, it was assumed that irregular words would enter the exemplar sequence with the same frequency as the regular words to which they were similar, or to which they were specific.

consideration should also be given to allowing contractions, abbreviations, and bound morphemes early in a reading program. Without these, sentences often tend to be awkward and unnatural. For example, using the words let us both when meaning "allow us" and for the imperative "let's" is not only awkward but confusing. If contractions, such as isn't, won't, and didn't are not allowed, then questions involving their full forms will always have to be asked in the positive form (e.g., Is he going to the store?), even when the negative form might be more appropriate from the context (presumably one is not going to write "Is he not going...?"). The use of common contractions might also decrease the length of time beginning readers read 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, beginning at least in the second year of instruction. See Cronnell (1970) for a description and sequencing of contractions and abbreviations.

Variation may change tense unnaturally within beginning stories if constraints are placed on the scripting by the absence of bound morphemes, such as -s, -es, (plurals and third-person singular), -ing (progressive present tense and the "going to" future) and -ed (past tense endings). There tends to be a lack of consistency both within the narration itself and between the narration, dialogue, and illustrations. Also, the choice of tenses can easily result in being based on the text vocabulary available rather than on natural use. Thus, for example, it is possible that the regularly-spelled, but irregular tense

form, ran would be allowed but not the regular base plus -ed, jumped. And for the sentence, "Look at Dan; he's jumping on the bed," the storywriter might have to substitute, "Look at Dan; he jumps on the bed," even when the latter has the connotation that Dan does this quite often.

Investigations should be made to determine whether the additional learning loads involved with contractions and such bound morphemes as -s, -ing, and -ed are really great enough in the first year of instruction to warrant sacrificing natural speech and possibly even hindering comprehension and reading fluency.

Grapheme 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 but ng, s, and th, and for all secondary vowels but ie, there is only one regular rule per grapheme unit. Primary vowels, however, each have an average of 6 regular 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 that occur in different environments. Primary vowels, on the other hand, have an average of 7 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 over the primary vowels), and faced with the environmental details prescribed by the rules, the learner might lose sight of the degree to which the most important information to be gained about each grapheme (its pronunciation)--can be condensed from rule information. Another aspect of this pronunciation overview that the learner might find useful is that the pronunciation variability is much lower for secondary and tertiary vowels than for primary vowels, and that the learner therefore has to concentrate more on environment specification for the primary vowel rules for indications of correct pronunciation than for all the other rules.

In section I of appendix B, there is listed for each grapheme unit, all of its possible pronunciations and the rules (or the specific grapheme unit) which cover each of the pronunciations. In Section II of appendix B, graphemes are grouped according to pronunciation variability. The purpose of grouping graphemes by their degree of pronunciation variability was to determine which graphemes could, in principle, have one or two pronunciations associated with

tion with little or no emphasis on environmental information, and which will require information about the position of the grapheme in that regular to determine the pronunciation.

Five categories of pronunciation variability are listed. Beginning with graphemes having invariant pronunciations, the categories are presented in order of increasing grapheme pronunciation variability. Within each category, the order of graphemes is: single consonants, geminate consonants, digraphs, primary vowels, and secondary vowels.

The data indicate that geminate 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 could not be fit into this description (by acknowledging automatic deletion of the reader of the correct allophones for d and n, for example) are s, z, z, and t. Consonant digraphs have one or sometimes two pronunciations, with the exceptions being ch and ng (and the latter's pronunciation depends on environment). Secondary vowels have one or two pronunciations, except for ea and ou which each have more than three 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 one pronunciation, with the allowance of 1-6 exception words; one-third have two pronunciations, with the allowance of 1-6 exception words; and only the remaining one-quarter have three or more pronunciations.

Section II

Specific Rule Sequence, Criteria, and Comments

Summary of Rule Sequence

First Year

(One-syllable words, Single consonants; Geminate consonants; Digraphs;
Short vowels)

Block 1 (Highest frequency single consonants; Geminate consonants;
General primary vowel Rule 15: short vowels)

1,1 N10, NN10, T10, (TT10)^c, 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 (Geminate vowel; Long vowel at end of word)

3,1 EE10, E25

3,2 Y19

See appendix D for the pronunciation, rule description, and example of each rule.

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 they have the same pronunciation. In Appendix C, it is noted here exemplars of the parenthesized rules first appear.

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

Second Year

(Two-syllable words; Long-vowels; Vowel-r; Other high-frequency vowel rules; High-frequency digraphs; Unstressed vowels; Common exceptions vowel rules; 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 (O11, G11; Suffixes with general primary vowel Rule 11)

- 7,1 O11, 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, L16, O16, 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),
O21, I21, A21, U21 (two-syllable words, first syllable stressed)
- 9,3 A25, O22

Block 10 (Unstressed vowels, Two-syllable words, second syllable stressed)

10,1 I17, E17, A17, O17 (first syllable stressed)

10,2 Y17, EE22

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, GG31)

11,1 NG10 (two syllables)

11,2 CH10, TCH10

11,3 WH10

11,4 QO10

11,5 GG10, CC12

11,6 GG31

Block 12 (high frequency, secondary vowels)

12,1 I12

12,2 E11, E31

12,3 I11, E12

12,4 W11, OW12

Block 13 (additional to the primary vowel rules)

13,1 I31, O31

13,2 U3, O23

13,3 I22, I24

Block 14 (no long vowels in VC(C) words)

14,1 unstressed VC(C)

14,2 unstressed VC(C)'

14,3 unstressed VC(C) and VC(C)'

Third Year

(8-9 age-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 8-9 words covered by First- and Second-Year rules)

15,1 8-9 one-syllable words with First-Year rules

15,2 8-9 words with Second-Year rules

Block 16 (Secondary vowels of medium frequency)

16,1 A110

16,2 OUIO

16,3 OEIO, OAIO

16,4 AWIO, AUIO

16,5 OIIO, OYIO

16,6 UEIO, UIIO, EWIO

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 C20

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 -tion
- 21,4 -tion

Block 22 (Stress patterns in three-syllable words)

- 22,1 stress pattern 3B
- 22,2 stress pattern 3A
- 22,3 stress pattern 3C
- 22,4 stress pattern 3'

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,
-en, -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 I17, Y17

- 26,3 A117
- 26,4 EA33
- 26,5 IE12, E110
- 26,6 EY10, E120
- 26,7 -ous, OU31, OU35, OU33, OU34
- 26,8 U131

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

DETAILED DISCUSSION OF RULE SEQUENCE

First year

One-syllable words; Single consonants; Geminate consonants; Digraphs;
Short vowels)

Frequency = 796

Block 1 (Highest frequency single consonants; Geminate consonants;
General primary vowel Rule 15: short vowels)

Frequency = 315

- Unit 1 N10, NN10, T10, (TT10), A15, I15 Frequency = 10
- Unit 2 P10, (P'P10) Frequency = 11
- Unit 3 L10 (7), 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

As explained in detail above, preparatory to specifying the contents of Block 1, the relative frequency of occurrence within the entire lexicon was determined for each single-grapheme 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. It was decided that instruction on short-vowel rules could precede instruction on long-vowel rules because the short-vowel rules are more productive and less environmentally complex than the long-vowel rules. The central concern at this point was that the sequence should begin with the most productive combination of rules. The next concern was to eliminate words considered to be unrepresentative of the central reading instruction (e.g., ass, bade, pith).

next page are frequencies of individual rules

Then the rank-order of Unit 1 of Block 1 was established by comparing the number of remaining 2-, 3-, and 4-letter lexicon words produced by all possible sequences of short-vowel and selected consonant rules. The optimal initial combination proved to be n, t, z, and l, and so the rules covering these graphemes formed Unit 1.

A similar procedure was used in calculating 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. Exemplars were considered to enter the lexicon at the point introducing the rule completing that exemplar's grapheme letters. For example, the word ten would enter the sequence in Block 1, Unit 4, because although T10 and N10 are introduced in Unit 1, E10 is not introduced until Unit 4. The rule rank-ordering which resulted from the determination of sequence-position productivity was divided into units of five letters, with consideration given to the size of exemplar sets for the first letter of each unit. See Appendix E for details.

Unit 1 exemplars were generated by searching for the same unit in the lexicon of the corresponding single consonant G10, N10 and N16 graphemes and the E10 case, in most instances, general consonants for the exemplars entered as their corresponding single consonant's grapheme letters, which are the rules introduced in Block 1. The instruction to the learner will be to treat the general case if it were only the general case, the exceptions to the "rule," and try all possible graphemes. The learner would search for a pattern of graphemes in the lexicon, the effect of single zero, double consonant, and other graphemes would be included with better exemplars for the

... and contrastive. Geminate consonants which have no exemplars at their time of introduction are reintroduced as their exemplars enter the sequence.

While double consonants occur in English orthography, they are not allowed in English phonology, except across word or morpheme boundaries, e.g., bockase, unknown. (In some languages, such as Italian, double consonants are phonemically distinct from single consonants.) Geminate correspondences do not occur in word-initial position. They are primarily found in medial position in words, with the following environment

single letter → geminate /V— $\left. \begin{matrix} \text{v} \\ \text{le} \\ \text{y} \end{matrix} \right\}$.

The only geminates in final position which have more than three SWRL lexicon exemplars are ck (a digraph which functions as the nonexistent kk geminate would), ff, ll, ss and zz. There are no geminates for n, j, v, w, x, and y.

Except for the Spanish borrowing llama, [and Welsh Lloyd and Llewellyn] geminate consonants occur only in medial and final position in English spelling. The most common final clusters are ff, ll, and ss... Rare final clusters are bb, dd, gg, nn, rr, tt, and zz... (Venezky, 1970, p. 106, fn. 8).

- l,l ll → l, e.g., an
- NNlO nn → n, e.g., inn
- tlO t → t, e.g., at
- TTlO tt → t, e.g., (tttle), (ttt)
- Af5 a → a / l(l)#, e.g., at, ant
- ll5 l → l / l(l), e.g., ll

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

Exemplars in parentheses are introduced in later blocks. No exemplars of their particular environments enter in the blocks in which the rule in question is sequenced.

As discussed above, Unit 1 is composed of the rules N10, T10 (plus their geminate rules), P15, and T15, these being the rules which together produce the best, albeit a small number of exemplars (10)

NN10 The geminate grapheme nn has the invariant pronunciation [n:] as in NN10. The only words in modern English with final nn are inn and proper names.

TT10. The geminate grapheme tt has the invariant pronunciation [t:] as in TT10. Final tt occurs in only two lexical items (butt, rut) and proper names. However, final tte, pronounced [t:], also occurs finally (barrette, brulette, and rosette). Although TT10 is sequenced here in Block 1, Unit 1, for reasons discussed above, the first occurrence of TT10 exemplars is in Block 9, Unit 2.

AL5 In certain dialects, some words may use [l:], e.g., Eastern and British glass, dance.

1.2 P10 p → [p:] (e.g., pp)

PP10 pp → [p:] (e.g., pp)

Unit 2 was found to be needed to compensate for the relatively large instructional deficit created by Unit 1. The rule selected for Unit 2, P15, as the rule which, when added, produced the best exemplar pronunciation with the rules in Unit 1.

PP15 The geminate grapheme pp has the invariant pronunciation [p:] as in PP15. The only occurrence of final pp, except in proper names, is the final occurrence of PEP exemplars in Block 9, Unit 2.

- 4.3 L10. l → [l], e.g., lip
LL10. ll → [ll], e.g., pill
S10. s → [s], e.g., sat
SS10: ss → [ss], e.g., pass

The remaining short-vowel and high-frequency, single-consonant rules were combined and rank-ordered by additive productivity. They were then divided into Units 3-6. In Unit 3, the rules L10, S10, and their geminates are sequenced.

L10: The grapheme l has only two pronunciations: [l] as in L10, and [ɫ] as in L20 and L40, except for in the word colonel.

LL10 The geminate grapheme ll has the invariant pronunciation [ll] as in LL10, except in borrowed Spanish words; e.g., tortilla. LL is the most frequent consonant geminate in the lexicon.

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 in Second Year.

S10 Following the introduction of S10, both s → [s] and s → [z] plurals and 3rd-person singulars of exemplars are allowed in order to facilitate the approximation of natural speech in the beginning stories. The correct pronunciations of regular plural morphemes are automatic in speech (e.g., [tʃ] vs. [tʃz] vs. [tʃs]). But since the appropriate response to the printed s may not

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occur automatically, instruction may explicitly acknowledge the alternative [ɪ] and [i] pronunciations of the morpheme -s and the exemplars could be separated for instruction on [s] and [ɪ] pronunciations. The [ɪ] pronunciation of -es is sequenced in Year 2 because of the additional, unstressed vowel. The [ɪ] 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 will be taught. Rule environments will not be made explicit at this point, since alternative pronunciations depending on contrasting rule environments are not yet presented.

- 1,4 010 dd (e.g., did)
 - 010 dd (e.g., add, hidden)
 - 011 et (/ et /), e.g., set, lend
- Unit 4 is composed of 010, 0110, and E15.

010 Verb past tenses are presently introduced in Second Year because of the variation in the pronunciation of the y as well as the d in the -ed endings (e.g., set, lend, hidden, did). If however, it is found that these variations are not difficult for four- and five-year-old children, it is advised that the affix -ed be added in Block 1, as was -s, in order to better

1.1.1. The grapheme ai in its native natural speech is the ai diphthong. The same suggestion is made very strongly for the verb suffix -ing, and also to a much lesser degree for the bound morpheme suffixes -er, -y, and -ly (all of which are presently sequenced in Second Year).

1.1.2. The grapheme dd has the invariant pronunciation [d] as in B10. The only words, besides proper names, in modern English with final dd are add and odd.

1.1.3. The grapheme an has the invariant pronunciation [an] as in B10. The only words, besides proper names, in modern English with final an are man and pan.

1.1.4. The grapheme mm has the invariant pronunciation [m] as in B10. The only words, besides proper names, in modern English with final mm are amm and amm.

1.1.5. The grapheme bt has the invariant pronunciation [b] as in B10. The only words, besides proper names, in modern English with final bt are but and put.

1.1.6. The grapheme bb has the invariant pronunciation [b] as in B10. The only words, besides proper names, in modern English with final bb are abb and bb.

1.1.7. The grapheme g has the invariant pronunciation [g] as in B10. The only words, besides proper names, in modern English with final g are agg and gg.

The graphemes in brackets are M1, B10, their geminates MM10, BB10, and GG10.

1.1.8. The grapheme ca has the invariant pronunciation [k] as in B10, except in the non-lexicon words comptroller and capitane.

1.1.9. The grapheme e has only two pronunciations, [e], as in B10, and [i], as in B6 and B40.

1.1.10. The geminate graphemes ss and tt have the invariant pronunciations [s] and [t] in MM10 and BB10, respectively. The first occurrence of their exemplars is in Block 5, Unit 1. There are no occurrences of ss or tt, except in proper names and other than proper names, the only words in modern English with final ss or tt.

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U15: The U15 exemplars with the environment /__r have been recorded as U21s. For instructional purposes, they have been placed in Block 9, Units 1 and 2 with the other Vowel 21 exemplars. U15 and U16 /__r have the same [r] pronunciation as E21 and I21.

1,6. R10: r → [r], e.g., run, (far)

RR10: rr → [r], e.g., (hurry)

H10: h → [h], e.g., had

O15: o → [ɒ], e.g., hot, odd

Sequenced in Unit 6 are the rules R10, RR10, H10, and O15.

R10 The grapheme r has the invariant pronunciation [r] as in R10, except in the words acre and ogre. Also, in some dialects, the r following a vowel is dropped. Parallel to Rule LE22 (sequenced in Block 10, Unit 2) there could be a rule RE22: re → [ɹ] /C __, e.g., acre, ogre. As just noted, these are the only irregular r exemplars in the present lexicon.

RR10. The geminate grapheme rr has the invariant pronunciation [r] as in RR10. The geminate rr occurs finally in only two lexical words (burrr, purr) and proper names. The first occurrence of RR10 exemplars is in Block 9, Unit 1.

H10 The grapheme h has only two pronunciations, [h] as in H10, and [ɸ] as in H20 and H40. There is no geminate hh. The frequency of H10 would have placed it in a later block. It was sequenced into Unit 6 of Block 1, however, due to the decision that the component graphemes

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SH0, cont. (e.g., s, t, h) of a digraph (e.g., sh, th in Block 2) should be introduced before the digraphs themselves.

Block 2 (Digraphs)

Frequency = 50

Unit 1 SH10

Frequency = 28

Unit 2 TH13 (6), TH11 (16)

Frequency = 22

Digraphs are presented and employed as graphemic 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 the digraph rule TH13 and the need for these function words in the early-instruction aspect of reading instruction.

2.1 SH10: sh > , 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 graphemes than the remaining single consonants, sequenced in Block 4, 3. The grapheme unit sh has the invariant pronunciation /ʃ/ in SH10.

2.2 TH13: th > in pronouns, conjunctions,
and function words, e.g., then, the, this

TH11: th > , e.g., thin

In Unit 2, TH11 is introduced at the same time as TH13, which has the function word exemplars, because of the near identity of the two th correspondences, /θ/ and /ð/, which differ only in voicing.

th for the word to be blended. In the reading lessons, the Ss would simply be reminded of the alternate pronunciation whenever an error was made. Once Ss read fluently enough to be affected by syntactical constraints, there should be few errors made between the [θ] of th function words and the [tʰ] of th content words.

NG10 is 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, then the beginning reader should have no problem reading base words which include the grapheme unit -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. The unit -ong, however, might best be postponed until Block 13, Unit 3 (with the introduction of Rule 024), unless it is found that the readers are not confused by the dialect variation of o → [ʊ], or [ɔ]/ng.

Block 3 (Geminate vowel, Long vowel at end of word)

Frequency = 51

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 025 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., ve, she

The long vowel e geminate, EE10 (e.g., see) and the long vowel e, E25, at the end of one-syllable, one-orthographic-vowel words (e.g., he), expose the reader to and prepare him for alternate pronunciations of vowels (in this case, the long-vowel sound of e in VCe exemplars), which will be elaborated upon in later blocks. This block also adds to the concept of letters representing more than one pronunciation.

The grapheme e 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 of e following from the diphthong e (trigraph ee)

EE10 and E25 occurs in an / (C)C__ (one-syllable) environment. The E25 exemplar has no other vowel, whereas an exemplar (to be introduced in Block 6) could have another vowel in VCe. The grapheme e in an / (C)C__ environment has the invariant pronunciation [i:], except in the words been and the.

e in an initial position, introduced here in high-frequency words (e.g., he, she) as rule exemplar,

... attention is now
... what will later be crucial word aspects,
... this is the first instance of a pronunciation
... explicitly taught
... environment (in this case, the end
... of a word)

Y19 $\frac{y}{_}$ $\frac{y}{_}$ / $\frac{y}{_}$ in
stressed syllables, e.g., try, grey

Block 2, rule Y19 occurs in word-final position in one-syllable
words, / $\frac{y}{_}$ / Y19 exemplars in stressed syllables will enter
Block 2 when two-syllable words are introduced. (Final
stressed syllables has a rule Y17 $\frac{y}{_}$ or $\frac{y}{_}$ pronunciation.
Block 10, Unit 2).

Block 2, Unit 2, Segment 10 (Quant)

- FF10 (34) Frequency = 34
- FF11 (31), FF19 (9), W16 (31) Frequency = 91
- U11 (37), N20 (34), U12 (59), U19 (57) Frequency = 187
- U12 (36) Frequency = 65
- U10 (12), X10 (14), Y10 (6) Frequency = 32
- Z10 (2), Z19 (2), Z210 (1) Frequency = 5

Block 2, Unit 2, Segment 10, includes the remaining
... those not taught in Block 10, as well as the
... (rule N20), which
... following the production of k.
... model is relatively automatic
... than to state it.

- F10 f > f, e.g., fat
- FF10 ff > ff, e.g., stiff
- W10 w > w, e.g., wet

Block 4's five most frequent consonants, in rank-order, are K10 (+N20), 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 grapheme correspondences as does [r], and they do not have environment-dependent pronunciations 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 geminate grapheme ff has the invariant pronunciation [ff], as in FF10.
- W10 The letter w has only two pronunciations [w] as in W10, and [p], as in W20 and W40. There is no geminate ww.

- N20 z > z, e.g., milk
- C12 c > / / — {

| | | |
|------------------|---|-----------|
| x | } | (anxious) |
| k | | (thank) |
| qu | | (banquet) |
| g pronounced [g] | | (single) |
| c pronounced [s] | | (Lincoln) |
- C12 c > / / — {

| | | |
|---|---|--------------|
| d | } | <u>cat</u> |
| o | | <u>cot</u> |
| u | | <u>cut</u> |
| l | | <u>crash</u> |
| | | (picnic) |
- K10 k > k, e.g., kick

The rules K10 (+N20), C12, and CK10 are combined for Unit 2 because they share a common pronunciation, [k].

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

CK10: The digraph ck has the invariant pronunciation [k] as in CK10.

N20: Regarding the Rule N20, it is optional to acknowledge the automatic sound change of n → [ŋ] / $\left\{ \begin{array}{l} [k] \\ [g] \end{array} \right\}$. Since Rule N20 is used in coding, this is where it should first have exemplars, due to Rule K10. Even if Rule N20 is not specifically taught, the exemplars would enter here.

C12: The most frequent and least complex pronunciation rules 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 call and gas. The alternative [s] sound of c and [ʒ] 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 in Second Year, following the introduction of the long-vowel rules.

Rule C12 occurs in the environment / $\left\{ \begin{array}{l} \emptyset \\ u \\ c \\ \# \end{array} \right\}$. This environment should be contrasted with the / $\left\{ \begin{array}{l} e \\ i \\ y \end{array} \right\}$ environment of C11, when the latter is introduced in Block 7. The only lexicon exception to C12 (i.e., to

c → [k] for that environment) is the word muscle;
nonlexicon exceptions are czar, indict, facade.

4,3: G12: g → [g] / $\left\{ \begin{array}{l} a \\ o \\ u \\ C \\ \# \end{array} \right\}$ gas
got
gum
grin
bag

Rule G12 is sequenced in Unit 3, immediately following C12, because of their similarity in environmental constraints on pronunciations: c → [k] and g → [g] / $\left\{ \begin{array}{l} a \\ o \\ u \\ C \\ \# \end{array} \right\}$. G12 has the same environment as C12, and it contrasts with G11 just as C12 does with C11. The geminates gg and cc are sequenced in Second Year because their pronunciation ([g] and [gʲ]; [k] and [ks]) are determined by the following vowel.

The only exceptions to G12 (i.e., to g → [g] for that environment) are the word judgment and the letter combination gn in which g → [∅] / $\left\{ \begin{array}{l} \# \\ _ \\ n(e) \\ \# \end{array} \right\}$. Final g occurs only in a small number of words, mostly monosyllables.

Rule G31 (g → [g] / $\left\{ \begin{array}{l} e \\ i \\ y \end{array} \right\}$) is an exception to Rule G11 (g → [j] / $\left\{ \begin{array}{l} e \\ i \\ y \end{array} \right\}$), but it has the same [g] pronunciation as G12. G31 is presently sequenced in Block 11, Unit 6, but it could be resequenced here in Block 4, Unit with G12, although its only exemplars at that point would be get, gift, gig, and gill.

4,4: J10: j → [j] jet

X10: x → [ks] box
 (oxen)

Y10: y → [y] yet

The consonants in Unit 4 (J10, X10, Y10) and in Unit 5 (V10, Z10, ZZ10) 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. The letter q, represented by the digraph qu, was inadvertently omitted from Year 1. QU10 would have only 7 exemplars if sequenced in Block 4, Unit 5. However, it should probably be included for the same reason V10, Z10, and ZZ10 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 and marijuana, and in the nonlexicon word, hallelujah. There is no geminate jj. The letter j generally occurs initially, sometimes medially, and never finally; nor can it occur doubled. The grapheme unit dj is used instead of doubled j, and dge or ge is used instead of final j.

X10: The letter x has only two pronunciations. [ks] as in X10 and [gz] as in X40, except for the [z] pronunciation in initial position, as in such nonlexicon words as xylophone, xerox, and xylem. The letter x in final position is always pronounced [ks] as in X10. There is no geminate xx.

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 the words beyond, canyon, and lawyer: The letter y occurs nine times more often as a vowel than as a consonant. There is no geminate yy.

4,5: V10: v → [v] vest
Z10: z → [z] zig-zag
ZZ10: zz → [z] buzz
 (dazzle)

V10, Z10, and ZZ10 are sequenced last in First Year due to their very low frequency.

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 lexical exemplars.

Z10: The letter z has the invariant pronunciation [z] as in Z10, except in the words waltz, glazier, and azure, and in nonlexicon borrowed French words, such as rendezvous. 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 geminate zz occurs finally only in the words buzz,

fuzz, and jazz. The first occurrence of ZZ10 exemplars is in the Block 10, Unit 1.

Since there are only five lexicon exemplars of V10, Z10, and ZZ10 at this point in the sequence, others could be introduced orally, and instruction on the correspondence should be repeated, if necessary, when other exemplars enter the sequence in Second Year.

Second Year

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

Frequency = 2299

Block 5 (Compounds; Suffixes, NG10)

Frequency = 68 (plus base words with suffixes)

Unit 1: Compounds

Frequency = 36

Unit 2: The -ing suffix with previously introduced based words.

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

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

Unit 5: NG10

Frequency = 32

Block 5 introduces two-syllable words, beginning with their least complex compounds and inflectional endings. Unit 1 contains compounds of previously introduced words, Unit 2 contains -ing endings of lexicon base words, Unit 3 contains the -ed ending for past tense and adjectives, and Unit 4 contains the -es ending for plurals and third-person singulars of base words. The exemplars in Units 1-4 involve First Year rules. They will thus serve as a review of pronunciation rules already covered, in addition to introducing the concept of syllables. Although environments can be specified for the [d], [t], and [ɪd] pronunciations of the -ed endings, it is not planned to teach these environments. Exemplars may, however, be grouped for instruction and practice according to these various pronunciations. The digraph -ng is also introduced in one-

syllable NG10 exemplars since the pronunciation is the same as in the -ing suffixes of Unit 2.

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

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 standstill is not in the lexicon, but could be introduced here because its components stand and still have already entered the sequence.

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

In Unit 2, which introduces the -ing gerund suffixes of base words, exemplars are presently uncoded, but could be separated for instruction between those which do have to 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 and other digraph 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 [ɪz] plurals and third-person singulars of base words. Exemplars are presently uncoded, 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 too much confusion arises for the readers concerning the unstressed [ɪz] 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 themselves were introduced. Exception: The -ies endings of Y19 base words will be introduced in 11,2 with Y17 exemplars which also involve suffixed forms in which the y changes to i + es. The -s [s] or [z] plurals of VCe base words enter the sequence in 7,2.

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

Unit 4 introduces the -ed [d], [t], and [ɪd] past tenses and adjectives of base words. Exemplars are presently uncoded, but could be separated for the three pronunciations. If too much 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. In speech, the correct pronunciation choice, [d], [t], or [ɪd], is made automatically.

E19: This rule applies when -ed or -es is a past tense or plural form (and not pronounced [əd] or [əz]), whether or not there is a simple verb or singular form (cf, Rule S31). Rule E19 has been used for coding purposes; in teaching, this should be considered a regular automatic phonological alternation (see Rule D10 and S10). Cf, Venezky (1970) and Vachek (1959).

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 the readers would already be familiar with the -ing correspondence.

As discussed in Block 2, the Rule NG10 could advisably be sequenced with the digraphs SH10, TH11, and TH13. The revision would be due to the allowance of -ing suffixes in Block 1 and to the fact that Rule NG10 itself is of high frequency, and its individual exemplars are too.

Block 6 (General primary vowel Rule 11)

Frequency = 259

Unit 1: E18, A11 (108), I11 (68)

Frequency = 176

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 the general primary vowel Rules 15 and 16, the short vowel rules. The -VCe rules are the first rules in the sequence whose environment specifies a particular letter (final, silent e). And these rules should be contrasted with the -VC(C) short vowel environmental characteristics. Rule 11 covering the silent final -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.

4.11

2.11

The Vowel II rules are divided into Units 1 and 2 by frequency, with All being the most frequent, and E11 the least.

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

All: a → [e] / __Ce#, e.g., name

111: i → [ay] / __Ce#, e.g., fine

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

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). v and u generally do not occur finally, but are followed by an e; e.g., have, continue (see general primary vowel Rule 38, and Rules U20, U26, and QU10). Sometimes final e may have two functions, as in nice where it marks both the i → [ay] (Rule 111) and the c → [s] (Rule C11) correspondences.

6,2: O11: o → [ɔ] / __Ce#, e.g., home

U11: u → [(y)u] / __Ce#, e.g., cute, crude

E11: e → [i] / __Ce#, e.g., eve

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

U11: In regard to Rule U11, some of its exemplars 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, j, 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 II of Volume II.

Block 7 (C11, G11; suffixes with general primary vowel Rule 11)

Frequency = 36

Unit 1: C11 (26), G11 (10)

Frequency = 36

Unit 2: -s, -d, and -ing suffixes added to words with primary vowel Rule 11

Block 7 introduces the alternative pronunciation of c and g. These rules state that c → [s] and g → [j] when followed by e, i, or 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. Thus, they are more complex than the -Vce (Vowel 11) rule, since they are not cued by as simple a condition as the final e of the long vowel exemplars. The C11 and G11 rules are sequenced to follow instruction on the Vowel 11 long vowel rules because C11 and G11 most often occur in the Vowel 11 -Vce environment, as -Vce and -Vge.

7,1: C11: c → [s] / $\left\{ \begin{array}{c} e \\ i \\ y \end{array} \right\}$, e.g., cent, lace, (city), (lacy)

G11: g → [j] / $\left\{ \begin{array}{c} e \\ i \\ y \end{array} \right\}$, e.g., gem, age, gin, (gypsy)

When C11's and G11's environments (/ $\left\{ \begin{array}{c} e \\ i \\ y \end{array} \right\}$) are contrasted with the more frequent C12's and G12's (/ $\left\{ \begin{array}{c} a \\ o \\ u \\ c \end{array} \right\}$), it should be pointed out to the readers that C11 and G11 do most often occur in a -VCE environment and that C12 and G12 cannot occur in this environment. The G12 pronunciation, [g], however, can occur initially or medially when followed by e or i; e.g., get, girl. These "frequent exceptions" to G11 are coded as G31 and are sequenced in 11,6.

Lexicon exceptions to C11 are pronounced [ʒ] or [ʃ]: licorice, ocean, species, and the irregularly-spelled endings -cion, -cious, -cier, -science, -scious; nonlexicon exceptions are: arcing, cello, concerto, sceptic. It can also be pointed out to the readers that although the letter combination sc is usually pronounced [sk], it is pronounced [s] when it precedes e, i, or y as in scene, scenic, science, scissors.

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 of Vowel 11, long-vowel (-VCE#) base words just as Block 5 introduced these suffixes for Vowel 15, short-vowel (-VC(C)#), base words. For the -s endings, the final e remains and is silent. For the -d endings, the final e remains and is silent, except when the final consonant is d or t; then the -ed ending is pronounced [ɪd]. For the -ing endings, the e is dropped. This will have to be pointed out to the

readers. 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, 7, and subsequent blocks.

Block 8 (Two-syllable words, first syllable stressed)

Frequency = 70

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

Unit 2: A16 (7), E16 (2), I16 (3), O16 (10), U16 (3) Frequency = 25

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

In Unit 1, all but two of the compounds, which involve rules from Blocks 5-7 (i.e., NG10, Vowel 11s, C11, G11), have Vowel 11 rules in them. For the compounds which have V11 correspondences at the beginning of the compound, it should be pointed out to the reader that it is because these exemplars are compounds that the e now in the middle of the word is still silent and not pronounced (e.g., firefly is pronounced [fáyrflay], not [fáræfli] or [fayríflay]).

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

I16: i → [i] / __CC..., e.g., insect

U16: u → [ə] / __CC..., e.g., umpire

E16: e → [ɛ] / __CC..., e.g., reptile

O16: o → [ɒ] / __CC..., e.g., costume

Unit 2 introduces general primary vowel Rule 16 in two-syllable words with the first syllable stressed. Rule 16s have the same short-vowel pronunciation in a / __CC... environment as Rule 15s,

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 of 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 syllabification. Words with the second syllable stressed are not introduced until the end of Block 10, and could even be postponed until the end of this Second Year sequence.

U16: Unlike the other vowels, the vowel u has the same pronunciation [ə] before an r as it does before other consonants. The instruction on U16 /__r, however, seemed more appropriately placed with instruction on the Vowel 21s (/__Vr), so these exemplars were recoded as U21s and sequenced with the other Vowel 21s in Block 9.

Block 9 (Vowels before r)

Frequency = 322

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

Unit 2: two syllables, first syllable stressed: E21 (150), U21 (5),
I21 (4), A21 (18), O21 (15) Frequency = 192

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

Block 9 introduces the next most frequent primary-vowel rule (after short and long vowels) in one-syllable words, the Vowel 21 rules. These rules cover the pronunciation of a vowel when followed by r. Since the ar rule (A21) is the most frequent of these rules, it comes first in the

sequence. It is followed by or (021), whose dialectical variations [o], [ɔ], and [a] should be acknowledged. The er, ir, and ur rules specify the same pronunciation, [ə] ([ər]), and are grouped together for this reason. These E21, I21, and U21 rules have the [ə] pronunciation whether they are stressed or unstressed. A21 and O21, however, while sharing this [ə] pronunciation when unstressed, do have different pronunciations when stressed. Thus, all -Vr correspondences (or -VrC, but not -Vre) are pronounced [ə] except for stressed ar and or.

E21, I21, U21, and all Vowel 17s followed by r, are pronounced as in -er, which can be written phonetically as [ər] in order to have a separate symbol for the vowel and consonant, or as [ə] since the sounds cannot be divided. In some dialects, the r following a vowel is not pronounced; in such a case, the phonetic representation of the -Vr would be [ə].

The -Vr rules are followed by A25 and O22, which are rules covering an exception to ar and or in which a different pronunciation occurs when ar or or are preceded by w. These war and wor rules also provide the first instance in the sequence of a correspondence with an environment specifying what precedes as well as what follows the rule-grapheme.

9.1: A21: a → [a] / __ {^{rC}_{r#}}, e.g., cart, car

O21: o → [o], [ɔ], [a] / __r, e.g., horn

U21: u → [ə] / __ {^{rC}_{r#}}, e.g., fur, burn

I21: i → [ə] / __ {^{rC}_{r#}}, e.g., bird, sir

E21: e → [ə] / __ {^{rC}_{r#}}, e.g., herd, her

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

021: There is considerable variation in the pronunciation of or, but most individual speakers will use only one form for all pronunciations. However, in some dialects, -oar- and -our- (pronounced [o]) may differ from -or- (pronounced [ɔ]). Thus, for some speakers, hoarse contrasts with horse, and mourning contrasts with morning.

9,2: E21: e → [ə] / __ {^{rC}_{r#}}, e.g., western, father
 (plus -er suffix with previously introduced words, e.g., banker.)

U21: u → [ə] / __ {^{rC}_{r#}}, e.g., sunburn, murmur

I21: i → [ə] / __ {^{rC}_{r#}}, e.g., birdseed

A21: a → [a] / __ {^{rC}_{r#}}, e.g., farmer, streetcar

O21: o → [o], [ɔ], [a] / __ {^{rC}_{r#}}, e.g., order, popcorn

Unit 2 introduces the Vowel 21 rules in two-syllable words having the first syllable stressed.

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 -er are allowed both because of their high frequency and because their pronunciation [ə], is the same as for stressed E21, taught in Unit 1.

Instruction on E21 in Unit 2 commences with the -er agent noun forms and comparative adjective forms of base words, including those in which the final consonant is doubled before the -er. Agent and

comparative forms of other previously taught words (including words with Vowel Rule 11) can also be taught here.

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

I21 & U21: I21 and U21 also have the same pronunciation, [ə], when stressed or unstressed but there are no lexicon exemplars of unstressed ir, and the only exemplars of unstressed ur (auburn, sulphur, suburb, surprise) cannot enter the sequence here due to their having other components which have not yet been taught.

A21 & O21: Unstressed ar and or receive instruction in 10,1 with other unstressed vowels rather than here, since their unstressed pronunciations, involving schwa, do differ from their stressed pronunciations.

9,3: A25: a → [o] / {^{wh}w / qu}__r, e.g., (wharf), war, (quart)

O22: o → [ə] / w__rc, e.g., word, worth

Rules A25 and O22 are introduced in Unit 3. Both share the /w__rC environment, but A25 also occurs in the environment:

/ {^wwh / qu}__r {[#]C}.

3.05

~~3.05~~

A25: The /wh__r and /qu__r exemplars of A25 enter the sequence in Block 11, Units 3 and 4, with WH10 and QU10, respectively. Thus, only the /w__r {[#]_C} environments need be taught here. A25 has a dialect variation of [o] and [ɔ] which should be acknowledged if necessary. The only exception to A25 is ward when it is an unstressed syllable (i.e., awkward, forward), in which case the pronunciation of the ar is [ə], just as it is for any other unstressed -Vr.

022: 022 occurs in a /w__rC environment (e.g., work). The only exception to 022 is the word worn (derived from wore, which is regular by Rule 011 or 021).

Block 10 (Unstressed vowels; Two-syllable words with second syllable stressed)

Frequency = 575

Unit 1: General primary vowel Rule 17, first syllable stressed:
I17 (36), U17 (6), E17 (89), A17 (45), O17 (37)

Frequency = 213

Unit 2: Y17 (142), LE22 (84)

Frequency = 226

Unit 3: Compounds, second syllable stressed

Frequency = 8

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

Frequency = 40

Unit 5: General primary vowel Rule 17, two-syllable words, second syllable stressed: A17 (39), E17 (19), O17 (31), U17 (5),
I17 (2)

Frequency = 88

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 graphemes. This problem, however, will probably be largely overcome as the readers learn about syllabification and stress.

If syllabification is taught at all, it should be flexible so that readers are not forced, for example, to divide the word mistake into mis-take' rather than what for them might be more natural: mi-stake'. In regard to stress patterns, readers would 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 ratio is 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., pilgrim,
furnish

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

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

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

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

Unit 1 commences with the rules I17 and U17 because the unstressed pronunciation of each is usually the same as its short

pronunciation ([ɪ] and [ə], respectively). Rules E17, A17, and O17 are then sequenced by frequency.

E17: Superlatives (-est) 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 -less, -ness, -en, and -ed, allow these forms of any previously taught base words, as well as the lexical exemplars.

A17 & O17: A17 and O17 exemplars should be separated for those which occur in the environment / r {[#]_C} because ar and or change from Rules A21 and O21 pronunciations (A21: [a]; O21: [o], [ɔ], [ə]) to A17 and O17 pronunciations ([ə]) when unstressed. E17, I17, and U17 / r {[#]_C}, on the other hand, have the same [ə] pronunciation as E21, I21, and U21.

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.

10,2: Y17: y → [i], [ɪ] / # in unstressed syllables, e.g., candy

LE22: le → [əl] / C #, e.g., little, stable

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. All their exemplars occur in the environment /...C #.

LE22: The grapheme unit, le, is invariantly pronounced [əl] as in LE22 when in the environment /...C # (cf, L10,

E18: le → [l] / V #: e.g., pale, style).

Y17: The pronunciation of Y17, unstressed y in word-final position, has the dialect variation [i] or [ɪ]. In isolation [i] is more common, but unstressed [ɪ] (cf. general primary vowel Rule 17) is often used in connected speech. *Webster's Seventh New Collegiate Dictionary* (1967) uses [i]; *Webster's New World Dictionary* (1957), and Kenyon and Knott (1953, p. 481) use [ɪ] but acknowledge the [i] pronunciation.

Y17 primarily occurs in -ly adverbial endings and -y adjectival endings of base words. The rule is productive and uncomplex allowing for additional practice on previously introduced rules contained in its exemplars.

For both Y17 and Y19, stressed y in word-final position, the y remains y / __ing. Y17 also occurs, and remains y, before other suffixes beginning with the letter i (e.g., ish, ist). Before suffixes not beginning with the letter i, however, in both Y17 and Y19 the y changes to i. For Y19, y → i / __^{ed}_{es}, and the i retains the [ay] pronunciation of the y in the Y19 base words. For Y17, too, the y → i / __^{ed}_{es}, and for these exemplars, the i retains the [i] pronunciation of the y in the Y17 base words. Y17 also occurs, and changes to i, before other suffixes not beginning with the letter i (e.g., -er, -est, -less, -ly, -ment, -ness).

10,3: Compounds (second syllable stressed), e.g., herself

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 of Block 10, some 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. These lexical compounds are composed of all previously taught rules. Nonlexicon compounds of other previously taught basewords are also allowed.

10,4: (Second syllable stressed)

I16: i → [ɪ] / __CC..., e.g., inform

U16: u → [ə] / __CC..., e.g., unless

A16: a → [æ] / __CC..., e.g., accept

O16: o → [a] / __CC..., e.g., trombone

E21: e → [ə] / __{^{rC}_{r#}}, e.g., perhaps

O21: o → [o], [ɔ], [a] / __r, e.g., cornet

EE10: ee → [i], e.g., indeed

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

10,5: (Second syllable stressed)

A17: a → [ə], [ɪ] in unstressed syllables, e.g., alike

E17: e → [ə], [ɪ] in unstressed syllables, e.g., except

O17: o → [ə], [ɪ] in unstressed syllables, e.g., connect

U17: u → [ə], [ɪ] in unstressed syllables, e.g., subtract

I17: i → [ə], [ɪ] in unstressed syllables, e.g., divide

Unit 5 introduces Vowel 17 exemplars which are two-syllable words having the second syllable stressed. Most of these exemplars also involve prefixes, such as a-, ex-, con-, pro-.

Block 11 (Consonant digraphs; GG10, CC12, G31)

Frequency = 214

| | |
|-------------------------------|----------------|
| Unit 1: NG10 | Frequency = 41 |
| Unit 2: CH10 (60), TCH10 (36) | 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 the rules for the common digraphs ch, wh, and qu. Also covered are the nonverb form exemplars of NG10, the geminates GG10 and CC12, and G31, a common exception to G11.

11,1: NG10: ng → [ŋ] / __#, e.g., ring

Unit 1 introduces NG10's -ing noun and adjective forms of base words. All of these exemplars can also be verbs and so could be sequenced in 5,2 with the uncoded -ing verb forms of base words (or in Block 2 if NG10 and -ing suffixes are moved up in the

sequence). NG10 also has final -ing exemplars which are not verb, noun, or adjective forms of 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 grapheme has other pronunciations besides [ŋ]. These pronunciations and their corresponding rule combinations are: ng → [ŋg]: N20, G12; ng → [ŋ]: N20, G31; and ng → [nʃ]: M10, G11. It is suggested that these correspondences be introduced here in 11,1 as a contrast to NG10's two-syllable exemplars, or in Third Year if the decision is made to sequence all of NG10's exemplars in Block 5 (or Block 2).

11,2: CH10: ch → [ʃ], e.g., church

TCH10: tch → [ʃ], e.g., match

The rules CH10 and TCH10 are sequenced together in Unit 2 because of their shared pronunciation, [ʃ], and complementary distributions. CH10 occurs primarily in word-initial position and following a consonant or secondary vowel in word-final position (i.e., /#__ and /...C__#). TCH10, on the other hand, does not occur initially, and it primarily occurs following a short vowel in word-final position (i.e., /...V__#). The es → [ɪz] plurals of base words ending in ch and tch should be sequenced in this unit.

TCH10: The grapheme tch is invariantly pronounced [ʃ] as in TCH10.

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

Unit 3 introduces WH10, which has the dialect variation: [w] or [hw]. The grapheme unit wh has only two pronunciations: [w] (or [hw] in some dialects) as in WH10 and [h] as in WH40.

~~3.3~~
3.3

11,4. QU10: qu → [kw], e.g., quick

Rule QU10 is introduced in Unit 4. The letters qu are 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 [k] as in QU40. The exemplars for Rule A25, itself sequenced in 9,3, which occur in the environments /whr and /qur, should be introduced in Block 11's Unit 3 and Unit 4 respectively. The remaining digraph rules, GH10, which is silent, and PH10, CH31, and TH12, which are all low-frequency correspondences, are sequenced in Third Year.

11,5: GG10: gg → [g], e.g., egg, wiggle

CC12: cc → $\begin{Bmatrix} a \\ o \\ u \end{Bmatrix}$, e.g., yucca, accord, hiccup

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

GG10: The grapheme gg is invariantly pronounced [g] as in GG10, except in the word suggest.

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

11,6: G31: $\underset{1}{g} \rightarrow [g]$, e.g., get, girl

If CC12 is deleted from Block 11, then Rule G31, sequenced in Unit 6, could be moved up into Unit 5 with GG10. Both have a [g] pronunciation. G31 is an exception to Rule G11, which has the same / $_ \left\{ \begin{matrix} e \\ i \\ y \end{matrix} \right\}$ environment. As an alternative to sequencing G31 here in Block 11, Unit 5 or 6, its one-syllable exemplars could be taught either with Rule G12 ($\underset{2}{g} \rightarrow [g]$) 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 -nger exemplars of G31 could then be introduced in Block 11 or Third Year with the N20, G12 and N10, G11 contrasts to Rule NG10.

Block 12 (High-frequency secondary vowels)

Frequency = 478

| | |
|-------------------------------|-----------------|
| Unit 1: AY10 | Frequency = 49 |
| Unit 2: EA11 (142), EA31 (42) | Frequency = 184 |
| Unit 3: OU12 (89), OO11 (54) | Frequency = 143 |
| Unit 4: OW11 (60), OW12 (43) | Frequency = 102 |

The only secondary vowel rule to have entered the sequence before Block 12 is Rule EE10, which was introduced in First Year, Block 3, because of its high rule frequency and its high individual exemplar frequencies. Also, as a geminate vowel rule having the same pronunciation as its individual letters' name ([iy], e), 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 grapheme, but different

phoneme), and homophones (i.e., same phoneme, but different grapheme). 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 rules have contrasting homograph correspondences presented with them. The second group of secondary vowels, introduced in Block 16 of Third Year, have medium frequencies (with the exception of high-frequency AY10 and OU10, which could be resequenced into Second Year) and are subgrouped by homophones with complementary distributions. The third group of secondary vowels, introduced in Block 26 of Fourth Year, have low rule frequencies.

The contrasting correspondences for the grapheme units ea, oo, and ow are sequenced as units 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, in these instances, it is not practical to teach the readers alternate pronunciations simultaneously, then, of course, the contrasting correspondences could be sequenced in a later block.

12,1: AY10: ay → [e], e.g., day

Block 12's introduction of secondary vowels 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 suggested that Rule A110 be sequenced here with AY10 rather than in Third Year, as at present. As well as having a high rule frequency, Rule A110 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

Unit 2 introduces the contrasting rules EA11 (ea → [i]) and EA31 (ea → [ɛ]). 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 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.

EA11: The following environments apply to EA11, but not

EA31:

/____ {

c
ch...
g...
l
m
p
sh
}

Other environments which apply to EA11, but not EA31, are:

$/_ \left\{ \begin{array}{l} se \\ son \\ sy \\ tuer\# \\ the\# \end{array} \right\}$. These will be introduced in Third Year, where their component rules (e.g., S20) are sequenced.

EA31: The environment $/_lth$ applies to EA31, but not to EA11. The environments $/_ \left\{ \begin{array}{l} sant\# \\ sure\# \\ ther\# \end{array} \right\}$ also apply to EA31, but not to EA11. They will be introduced in Third Year. Other environments, e.g., $/_ \left\{ \begin{array}{l} d \\ f \\ r \end{array} \right\}$ apply both to EA11 and EA31.

12,3: 0011: $\underline{oo} \rightarrow [u]$, e.g., broom

0012: $\underline{oo} \rightarrow [u]$, e.g., book)

Unit 3 introduces the rules 0011 ($\underline{oo} \rightarrow [u]$) and 0012 ($\underline{oo} \rightarrow [u]$).

The following environments apply to 0011, but not to 0012:

$\left\{ \begin{array}{l} \# \\ n \\ m \\ p \\ st \\ th \end{array} \right\}$

The environments $/_ \left\{ \begin{array}{l} h \\ se \end{array} \right\}$ also apply to 0011, but not to 0012. They will be introduced in Third Year. There is no environment that applies only to 0012 and not to 0011, although the environment $/_k$ applies primarily to 0012.

12,4: 0W11: $\underline{ow} \rightarrow [o]$, e.g., below, own

0W12: $\underline{ow} \rightarrow [aw]$, e.g., allow, owl

Unit 4 introduces the rules 0W11 ($\underline{ow} \rightarrow [o]$) and 0W12 ($\underline{ow} \rightarrow [aw]$).

The grapheme unit ow has only two pronunciations: [o] as in 0W11, and [aw] as in 0W12, except for the word knowledge. Also, in some dialects, an unstressed 0W11 is pronounced [ə].

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 ow.

Because of its high frequency and its being in complementary distribution with OW12 (ow → [aw]), Rule OUI0 (ou → [aw]) would be more appropriately sequenced, following OW12, as Unit 5 of this Block 12 rather than as it is now in Third Year with the medium-frequency secondary vowels.

Block 13 (Additional common primary vowel rules)

Frequency = 197

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

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

Unit 3: I22 (21), O24 (5†) Frequency = 72

Block 13 introduces some additional 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 nearly comprehensive pronunciation predictability of English words. Instruction will be based on specifiable environments, when this is a rule characteristic. When not, the exemplars will 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: 031: o → [ə], e.g., won, love

U31: u → [u], e.g., bull, push

Unit 1 introduces the common vowel rule exceptions, Rules 031 (o → [ə]) and U31 (u → [u]).

031: Rule 031 occurs in stressed syllables where other pronunciations would be expected. In fact, there are no 031 environments which do not also apply to other o rules. Rule 031 generally occurs in the following

environments: / $\left\{ \begin{matrix} n \\ m \\ th \\ v \end{matrix} \right\}$

U31: Rule U31 occurs primarily in the suffix, -ful, as well as in the word full and compounds of it. Otherwise, its environments are generally / $\left\{ \begin{matrix} b \\ p \end{matrix} \right\}$ $\left\{ \begin{matrix} l \\ sh \end{matrix} \right\}$.

No other rules for the grapheme u (e.g., U15, U16, U17) have these environments.

13,2: A23: a → [ɔ] / $\left\{ \begin{matrix} l \\ k \\ t \\ d \end{matrix} \right\}$, e.g., ball, walk, salt, bald

023: o → [o] / lC#, e.g., roll, yolk

Unit 2 introduces Rules A23 (a → [ɔ]) and 023 (o → [o]), both of which occur in the environments / $\left\{ \begin{matrix} l \\ k \\ t \\ d \end{matrix} \right\}$. Rules A23 and 023 also occur in the environment / lk, but these exemplars, due to the silent l, will be introduced in Third Year.

023: Rule 023 applies in the environment / l# in stressed syllables. The only lexical exemplars are control and patrol, which are presently coded as exceptions, but which could be sequenced in this unit.

13,3: 122: $\underline{i} \rightarrow [ay] / _ \left\{ \begin{matrix} nd \\ ld \\ gn \end{matrix} \right\} \#$, e.g., find, wild, sing

024: $\underline{o} \rightarrow [ɔ] \text{ or } [a] / _ \left\{ \begin{matrix} fC \\ g\# \\ ng \\ nk \end{matrix} \right\}$, e.g., soft, dog, song, honk

Unit 3 introduces Rules 122 ($\underline{i} \rightarrow [ay]$) and 024 ($\underline{o} \rightarrow [ɔ]$ or $[a]$).

122: Rule 122 occurs in the environments $/ _ \left\{ \begin{matrix} nd\# \\ ld\# \end{matrix} \right\}$. 122 also occurs in the environment $/ _ gn\#$. These exemplars, due to the silent g (Rule G20), are sequenced in 19,3 of Third Year with the introduction of silent letters.

024: Rule 024 has the dialect variation $[ɔ]$ or $[a]$ and occurs in the environments $/ _ \left\{ \begin{matrix} fC \\ g\# \\ ng \\ nk \end{matrix} \right\}$. These environments apply to Rule 024, but not to any other o rules. The words on and onto, coded as "016...P" (i.e., $\underline{o} \rightarrow [a]$, with other pronunciations recognized), also have this $[ɔ]$ and $[a]$ dialect variation. The following environments apply to Rule 024, but also to other o rules: $/ _ \left\{ \begin{matrix} ss \\ st \\ th \end{matrix} \right\}$. The environment $/ _ st$ will be deleted from future versions of this rule since there are nearly as many exceptions (pronounced $[ɔ]$) as exemplars (ct, lost and most).

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). This affects the following rules in particular: 024, 021, and A24.

Block 14 (Nonlong vowels in -VC(C)e words)

Frequency = 80

Unit 1: Vowel 16s in Stressed -VCCe# Frequency = 35

Unit 2: Vowel 21s in Stressed -VrCe# Frequency = 18

Unit 3: Vowel 17s in Unstressed -VCCe# and -VCe# Frequency = 27

Block 14 introduces the short vowel pronunciations in the environment -VCCe, which is similar to both the previously specified short vowel (-VCC([#]_V)) and long vowel (-VCe) rules. In the case of -VCCe exemplars, however, the final silent e does not mark a long vowel pronunciation, but rather the e marks a morphemic boundary and/or the pronunciation of the final consonant. In nearly all of the exemplars in this block, the final consonant is c, g, s, or v. Without the following e, the graphemes c and g would be pronounced [k] and [g] rather than [s] and [j] (e.g., compare the nonword sinc with since, and urg with urge). Without the marker e, an s might be pronounced [z] or appear to be a plural (e.g., dens vs. dense). And final y does not occur in English (e.g., twelv would be a nonword).

14,1: stressed VCCe#, e.g., dance

In Unit 1, the specific consonants in the -VCCe environments of these short vowels are: -dgc, -ncc, (-nce, -nse), and -lcc (-ive, -lsc, -lge). Examples are, badge, dance, and shelve.

14,2: stressed VrCe#, e.g., nurse

In Unit 2, the consonants in the -VrCe environments of these vowel 21s (vowels followed by r) are: -rse (e.g., curse), -rve (e.g., carve), and -rge (e.g., charge).

14,3: unstressed VCCe# and VCe#, e.g., absence

In Unit 3, the consonants in the unstressed -VCCe and -VCe environments of the Vowel 17s (unstressed vowels) are: -nce (e.g., absence), -Vge (e.g., bandage), and -Vce (e.g., furnace).

If program developers find that the readers are too confused by the nonlong vowel pronunciations in -VCCe exemplars, as opposed to the regular long vowels in -VCe environments, then the correspondences and exemplars in Block 14 could be postponed until Third Year. Otherwise, as sequenced here, Block 14 would be the final instructional segment in Second Year.

Third Year

(8-9 age-level words; three-syllable words; Medium-frequency primary and secondary vowels; Low-frequency consonants; Silent letters; Major palatalizations; Affixes; Three-syllable stress patterns)

Frequency = 3213

Block 15 (Review, employing 8-9 words covered by First- and Second-Year rules)

Frequency = 904

Unit 1: 8-9 one-syllable words with First Year rules Frequency = 84

Unit 2: 8-9 words with Second Year rules Frequency = 820

Block 15 is a review block, employing all 8-9 age-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.

15,1: 8-9 one-syllable words with First Year rules

15,2: 8-9 words with Second Year rules

This unit provides for the systematic review of Second Year correspondences. Since age-grading 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 (Secondary vowels of medium frequency)

Frequency = 488

Unit 1: AIIO Frequency = 135

Unit 2: OUIO Frequency = 98

Unit 3: OEIO (7), OAIO (82) Frequency = 89

| | |
|--|----------------|
| 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 Second Year (Block 12); low-frequency ones are introduced in Fourth Year (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.

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 [].

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 OI1 (6,2) with oCe.

OE10: Medial oe is generally a combination of o and e, e.g., poet (see Rule 026, 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] (e.g., Rule 015); thus dawn and Don may not contrast.

AW10: This rule is invariant, with no exceptions.

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

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

EW10: ew → [(y)u], e.g., few

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

UE10: The spelling ue is considered to be pronounced [(y)u], although it may often be disyllabic ([(y)uəl]), e.g., fuel (cf, Rule U26; 25,2). All exceptions to this rule are cases of silent final ue after g; i.e., ue → ∅ /g_#; e.g., league.

UI10: All exceptions to this rule are pronounced [ɪ], e.g., build, and are classified under Rule U31 (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 → [(y)u], e.g., feud, Eugene. Rule EW10 is nearly invariant, with the primary exception being sew and its derivatives.

Block 17 (Suffixed and compound three-syllable words, Suffixes)

Freq. y = 402

- | | |
|--|-----------------|
| Unit 1: Three-syllable compounds | Frequency = 123 |
| Unit 2: Two-syllable words with suffixes: -er (45), -en (9), -ing (16), -y (14), -s (49), -ed (29) | Frequency = 162 |
| Unit 3: Three-syllable words with suffixes: -er (48), -en (3), -ing (12), -ed (6), -ly (48) | Frequency = 117 |

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 and this unit is a "clean-up" operation. 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 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 morphological changes.

-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].

~~325~~

327

-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

Some of the words in this unit are compounds which do not exist as a compound base form without the suffix; e.g., nutcracker is not formed from nutcrack. Rather, these words are compounds of a base word plus a suffixed word, e.g., nut + cracker.

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: [i] or [ə]) when -ly is added, e.g., happily. The suffixed form -fully (e.g., cheerfully) is sometimes pronounced as one syllable [fli].

Block 18 (Primary-vowel and single-consonant rules of medium frequency)

Frequency = 512

Unit 1: E13 (121), O13 (72), A13 (43), I13 (39),
U13 (29)

Frequency = 304

Unit 2: S20 (94), S21 (56)

Frequency = 151

Unit 3: A22

Frequency = 29

Unit 4: 025

Frequency = 28

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: o → [o] / __CV, e.g., open

A13: a → [e] / __CV, e.g., baby

I13: i → [ay] / __CV, e.g., final

U13: u → [(y)u] / __CV, e.g., duty

In this unit, general primary vowel Rule 13 is introduced:

$V \rightarrow [\check{V}] / _CV$. This is related to general primary vowel Rule 11 (the "V-check" rule: $V \rightarrow [\check{V}] / _Ce\#$; Block 5), but with the environment extended to all vowels after a single consonant and to e when not in final position. There are many exceptions ($V \rightarrow [\check{V}] / _CV$) 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 instructional solution can be suggested: teach children to have a set for diversity (cf, Levin & Watson, 1963a, b; Williams, 1968) when encountering vowels in the environment / __CV (where C ≠ r, which requires Vr rules). The 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 ds (Volume II, Section III), indicated as follows:

$V \rightarrow [\check{V}] / _ _ CV$

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

$\underline{e} \rightarrow [\text{ɛ}] / _ _ CV$

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

$\underline{o} \rightarrow [\text{ɑ}] / _ _ CV$

$\underline{u} \rightarrow [\text{ʊ}] / _ _ CV$

- 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]. (If Rule E11 is not taught in Second Year, this would be an appropriate place to teach it.)
- 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] / $\left\{ \begin{array}{l} a \\ ea \\ oo \\ ou \end{array} \right\}$ __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.

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).

(Since Rule S21 involves the most common pronunciation of s ([s]), it could be sequenced along with Rule S10 (1,3). 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 their pronunciation is the same as in the following environment, in most dialects. 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 r--of considerable dialect variation.

(If Rule A25 is not taught in Second Year, this would be an appropriate place to introduce it.)

18,4: 025: o → [ɔ] / __#, 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 and has no exceptions.

The following are correspondences for other final vowels:

a → [ɹ] / __# in stressed syllables, primarily one-syllable words, e.g., ha. See Volume II, Section III.

a → [ə] / __# unstressed in most words of two or more syllables, e.g., comma. See Rule A17 (10,1).

i → [i] / __#, e.g., ski, taxi. See Rule I35 (23,2).

u → [(y)u] / __#, e.g., flu, menu. See Volume II, Section III.

Block 19 (Silent letters)

Frequency = 287

- Unit 1: Three-syllable words with suffixes:
-ment (23), -or (14), -ive (14),
-ness (12), -ance/-ant (18) Frequency = 81
- 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 (lack of pronunciation is indicated by \emptyset). In 19,2 the position of the grapheme units varies; in 19,3 they are initial; in 19,4, final; in 19,5 and 19,6, medial.

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. Commonly, especially when the base ends in [t] or [d], a syllabic [n] ([ŋ] is used instead of [ən], thus [ŋs]/[ŋt]).

19,2: IE14: ie → [ay] / __#, e.g., die

124 + GH10: i → [ay] / __gh, 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 124 + 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.)

124 + 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 → ∅ / __#, e.g., pooh;

c. h → ∅ / __V unstressed, e.g., graham.

In speech, rule (c) also applies to unstressed function words, e.g., hit him → [hɪtɪm] (= hit 'im).

19,3: K20: k → ∅ /# __n, e.g., knee

G20: g → ∅ / {# __n, __n#}, e.g., gnat, sign

W20: w → ∅ /# __r, e.g., write

K20: This invariant rule is a result of English phonotactics, which does not allow initial [kn].

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 i is

governed by Rule 122 (introduced in 13,3):

$\underline{i} \rightarrow [ay] / \underline{\quad}gn\#,$ e.g., sign.

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

19,4: B20: $\underline{b} \rightarrow \emptyset / m\underline{\quad}\#,$ e.g., bomb

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

19,5: L20: $\underline{l} \rightarrow \emptyset / \left\{ \begin{array}{l} o\underline{\quad}k \\ a\underline{\quad}k \\ a\underline{\quad}f \\ a\underline{\quad}v \\ a\underline{\quad}m \end{array} \right\},$ e.g., yolk, walk, half, salve, palm

T20: $\underline{t} \rightarrow \emptyset / \left\{ \begin{array}{l} s\underline{\quad}le \\ s\underline{\quad}en \\ f\underline{\quad}en \end{array} \right\} \#,$ e.g., castle, listen, often

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

L20: In addition to Rule L20, Rules 023 and A23 (13,2) apply to the sequences o!k and alk, respectively. Many exemplars of the sequence alm are irregular because of the following minor rule: $\underline{a} \rightarrow [a] / \underline{\quad}lm,$ e.g., palm.

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

19,6: U20: $\underline{u} \rightarrow \emptyset / \#g\underline{\quad},$ e.g., guess

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

Block 20 (Consonant digraphs; Double consonants)

Frequency = 119

- Unit 1: Three-syllable words with suffixes:
-y (12), -ful (8), -al (7), -able (6),
-eth (5), -less (4), -ist (4), -ish (2) Frequency = 48
- Unit 2: PH10 (19), CH31 (20) Frequency = 39
- Unit 3: TH12 Frequency = 26
- 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: -y, -ful, -al, -able,
-eth, -less, -ist, -ish

-y → [i] (Rule Y17; 9,2), e.g., injury

-ful → [fʊl] (Rule U31; 13,1) or [?][fəl] (Rule U17; 10,1), e.g.,
colorful

-al → [əl], e.g., musical

-able → [əbəl], e.g., suitable

-eth → [iθ], e.g., fortieth

-less → [lɪs] or [ləs], e.g., odorless

-ist → [ɪst], e.g., organist

-ish → [ɪʃ], e.g., yellowish

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

20,2: PH10: ph → [f], e.g., phone

CH31: ch → [k], e.g., school

PH10: This is an invariant correspondence.

CH31: While often unpredictable, this correspondence always holds in the following environment: /# ^l{r} }, e.g., chrome, chlorine. The correspondence is generally applicable in more common words with the environment /#s , e.g., school. However, in a number of less common words (generally of German origin) the correspondence for sch is [ʃ], e.g., schwa.

20,3: TH12: th → [ð] / { e / er / ern } #, e.g., breathe, gather, northern

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

The following correspondences apply with TH12:

o → [ə] / ther (Rule O31), e.g., brother;

ea → [ɛ] / ther (Rule EA31), e.g., weather.

20,4: CC11: cc → [ks] / { e / er / ern } #, e.g., success, accident

This rule was not used in Berdiansky et al. (1969), where words were coded C12, C11. (If Rules CC12 and GG10 are not taught in Second Year, this would be an appropriate place to introduce them.)

Block 21 (Palatalizations)

Frequency = 177

- Unit 1: Three-syllable words with prefixes:
un- (19), re- (6), dis- (5), in- (4),
mis- (3) Frequency = 37
- Unit 2: -tion Frequency = 81
- Unit 3: -sion → [ʃən] (20), -sion → [zən] (12) Frequency = 32
- Unit 4: -ture 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 Volume II, Section V.) Palatalizations are certain spelling-to-sound correspondences which result in the sounds [ʃ], [z], [ʒ], and [j] and are discussed in greater detail in Cronnell (1971, pp. 33-35). 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 [ri], e.g., reopen
- dis- → [dis], e.g., disappear
- in- → [In], e.g., inhuman
- mis- → [mis], e.g., misbehave

21,2: -tion → [ʃən], 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 [éʃən], 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 [ʃən], e.g., suggestion. This is a phonological alternation and may be automatic.

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

A. Long vowel in base word becomes short vowel in suffixed word, sometimes with attendant consonant changes.

1. ai → [e] → e [·] + 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. d → t / __ion, e.g., intend, intention

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

21,3: -sion → [ʃən], e.g., mission, mansion

-sion → [ʒən], e.g., occasion

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

All occurrences of -ssion are pronounced [ʃən]. This ending comes from three sources in the present lexicon:

1. base word ending in ss + ion, e.g., discuss, discussion;
2. base word ending in t + ion → ssion, e.g., permit, permission;
3. base word ending in ede [id] + ion → ession [ʃən], e.g., procede, procession (cf. -ive; 19,1).

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

1. Vd- [Vd] + ion → vsion [Vʒən], e.g., conclude, conclusion;
2. ide [ɪd] + ion → ision [fʒən], e.g., divide, division.

21,4: -ture → [ʃər], e.g., picture

In the present lexicon, this is the second most frequent ending involving palatalization. Most generally, -ture is a pseudo-suffix, e.g., future, although the regular affix -(t)ure is occasionally found, e.g., moisture, mixture.

Block 22 (Nonaffixed three-syllable words)

Frequency = 324

| | | |
|---------|-------------------|-----------------|
| Unit 1 | Stress pattern 3B | Frequency = 92 |
| Unit 2: | Stress pattern 3A | Frequency = 124 |
| Unit 3: | Stress pattern 3C | Frequency = 89 |
| Unit 4: | Stress pattern 3D | Frequency = 19 |

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] 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 [ˈstɛmət], as a noun 3A [ˈɛstəmit].) 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

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

Frequency = 1129

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 (Specific primary vowel rules)

Frequency = 151

Unit 1: A29 (29), A24 (43) Frequency = 72

Unit 2: I35 (21), I25 (27) Frequency = 48

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 → [e] / __{^{nge}_{ste#}}, e.g., danger, paste

A24: a → [a] / {^w_{qu}}__, e.g., wad, squat

This unit includes special rules for the letter a.

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

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 k, ng, x, c pronounced [k], or g pronounced [g]. It also does not apply before r, 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: 135: i → [i], e.g., police

125: i → [y] / C__V_{unstressed}, e.g., junior

This unit includes special rules for the letter i.

135: 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 l and hi).

125: In this rule, i functions unpredictably as a consonant. The most common environment is / l_n __, e.g., million, onion.

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

Y13: y → [ay] / __CV, e.g., tyrant

Y15: y → [ɪ] / __C(C)#, e.g., gym

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 (Four-syllable words; Rules for exceptions to general primary vowel Rule 13)

Frequency = 223

- Unit 1: Four-syllable compounds (11); Four-syllable compounds with suffixes:
-ing (7), -y (1), -er (6), -or (8),
-en (1), -ed (2), -ly (14) Frequency = 50
- Unit 2: E38 (38), I38 (22), A38 (21), O38 (8) Frequency = 89
- Unit 3: A28 (19), I28 (17), Y28 (2), O28 (20),
E28 (9) Frequency = 67
- Unit 4: General primary vowel Rule 27 Frequency = 17

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 $V \rightarrow [\check{V}] / _CV$ (cf, 18,1).

24,1: Four-syllable compounds

Four-syllable words with suffixes: -ing, -y, -er, -or, -en, -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 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: e → [ɛ] / _{\check{V}}V, e.g., Texas, level

I38: i → [ɪ] / _{\check{V}}V, e.g., river

A38: a → [æ] / _{\check{V}}(l)V, e.g., axis, axle, cavern

O38: o → [ɑ] / _{\check{V}}V, e.g., oxen, novel

General primary vowel exception Rule 38 is as follows:

$V \rightarrow [\check{V}] / _ \overset{x}{\underset{v}{V}} (1)V$; it does not apply to u or y for any words in the present lexicon; nor are there exemplars of i in the environment $/ _ xV$. The environment including l appears only in one word, axle. The rule always works for 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 x). For vowels before v, there is considerable variation between Rules 13 and 38 (cf, evil, devil), and it may be advisable to eliminate this rule for v. (Exemplars with v could be taught as exceptions to Rule 13; see 18,1.)

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

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

V28: $\underline{y} \rightarrow [ɪ] / _ C \begin{Bmatrix} ic \\ id \\ ish \\ it \end{Bmatrix}$, e.g., physic

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

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

General primary vowel Rule 28 is as follows: $V \rightarrow [\check{V}] / _ C \begin{Bmatrix} ic \\ id \\ ish \\ it \end{Bmatrix}$.

This rule does not generally apply to u. The endings id, ish, and

it are not suffixes, but 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 → [Ǟ] / __C ic

V → [Ǟ] / __C it

V → [Ǟ] / __C ish

V → [Ǟ] / __C id

Y28: The only exemplars of Rule Y28 are in the environment / __C ic.

E28: There are no exemplars of Rule E28 in the environment /C id.*

24,4: General primary vowel Rule 27

General primary vowel Rule 27 is as follows: V → [Ǟ] __C ity, e.g., humanity. ability. Rule 27 could be included in general primary vowel Rule 28 (24,3) but has not, however, since its occurrence involves four-syllable words. In addition, most exemplars of Rule 28 are cases of base plus -ity (→ [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 [i]), changing to [Ǟ] when the suffix is added. As with Rule 28, the syllable

before the ending (-ity) is stressed, e.g., moral [móral], mórality [morəlɪti].

Because of the limited number of exemplars, this rule is not taught by individual letters, but is generalized across letters.

Block 25 (Remaining general primary vowel rules)

Frequency = 240

| | |
|--|----------------|
| Unit 1: Four-syllable words with <u>-tion</u> | Frequency = 61 |
| Unit 2: I26 (30), Y26 (2), U26 (11), E26 (15), O26 (3), A26 (2) | Frequency = 63 |
| Unit 3: I36 (35), Y36 (2) | Frequency = 37 |
| Unit 4: A12 (18), I12 (9), Y12 (2), O12 (2), U12 (2) | Frequency = 33 |
| Unit 5: E14 (20), I14 (9), Y14 (4), A14 (6), O14 (4), U14 (3) | Frequency = 46 |

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 → [ʃən]

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 [kənsəlɛʃən]), 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 [fʃən];
- 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 → [V̄] / __-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 [raɪət], area [éɪə].

I26: This rule should be compared with Rule 125, 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 → [i] / __-V, e.g., Indian

Y36: y → [i] / __-V, e.g., embryo

These exception rules have the same environment as Rules 126 and Y26, but a different pronunciation.

I36: Cf, Rule 135 (23,2) which has the same pronunciation.

25,4: A12: a → [e] / __C{r}e#, e.g., table

I12: i → [ay] / __C{r}e#, e.g., title

Y12: y → [ay] / __C{r}e#, e.g., cycle

O12: o → [o] / __C{r}e#, e.g., noble

U12: u → [(y)u] / __C{r}e#, e.g., bugle

This unit introduces general primary vowel Rule 12:

$V \rightarrow [\bar{V}] / _C\{r\}e\#$, which is an extension of Rule 11 (Block 6), with r or l 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 Volume II, Section III).

The rule apparently has no exemplars with e.

25,5: E14: e → [i] / __C{r}V, e.g., secret, cathedral

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

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

A14: a → [e] / __C{r}V, e.g., April

O14: o → [o] / __C{r}V, e.g., okra, only

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

This unit introduces general primary vowel Rule 14:

V → [V̄] / __C{r}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 exemplars of this rule in the environment / __CIV.

Block 26 (Low-frequency secondary vowel rules)

Frequency = 311

- Unit 1: Four-syllable words with suffixes:
-able (19), -ment (5), -al (8),
-ness (2), -ary (2), -ist (1) Frequency = 37
- Unit 2: IE17 (12), EY17 (23) Frequency = 35
- Unit 3: A117 Frequency = 10
- Unit 4: EA33 Frequency = 18
- Unit 5: IE12 (39), E110 (15) Frequency = 54
- Unit 6: EY10 (9), E120 (19) Frequency = 28
- Unit 7: -ous (38), OU31 (26), OU35 (27),
OU33 (19), OU34 (11) Frequency = 121
- Unit 8: U131 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 Volume II, Section IV).

IE17: For stressed final ie see Rule IE11 (19,2). Medial ie is 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 [n], e.g., mountain [máwntn̩].

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

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

26,5: IE12: ie → [i] / ...__..., e.g., field

EI10: ei → [i], e.g., seize

Both rules have the same pronunciation ([i]) and occur only medially.

IE12: Final ie is covered by Rules IE11 (19,2) and IE17 (26,2). In addition, the sequence ie may be a combination of i and e, e.g., diet (see Rule 126 in 25,2).

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

26,6: EY10: ey → [e], e.g., they

EI20: ei → [e] / $\left\{ \begin{array}{l} gh \\ gn \\ n \end{array} \right\}$, e.g., weigh, reign, vein

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 ey is covered by Rule EY17 (26,2). The only exceptions to this rule are key and eye and their derivatives.

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

26,7: -ous → [əs], e.g., dangerous

OU31: ou → [ə], e.g., touch

OU35: ou → [o], e.g., though

OU33: ou → [u], e.g., soup

OU34: ou → [ɔ], e.g., fought

This unit introduces the many remaining pronunciations of ou, 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.

OU34: The sequence our is pronounced [ər] ([ə]), e.g., courage.

OU35: All but one of the exemplars of this exception rule are in the environments / ^{gh}_r . The pronunciation of our is variable, e.g., four.

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

OU35. 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 grapheme unit 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 (Four-syllable words; General primary vowel Rule 32)

Frequency = 204

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

Unit 2: Stress pattern 4A (59), Stress pattern
4B (10) Frequency = 69

| | |
|--|----------------|
| 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 (49), 032 (13), A32 (7), 132 (3) | Frequency = 72 |

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., asparagus

Stress pattern 4B: -'-', e.g., abbreviate

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., tonsillitis

27,4: Stress pattern 4D: '-'-, e.g., alligator

27,5: Other four-syllable words

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

'---, e.g., accuracy

'--', e.g., mèeteorite

'--', e.g., marionette

27,6: E32: e → ∅, e.g., difference

O32: o → ∅, e.g., history

A32: a → ∅, e.g., separate (Aj)

I32: i → ∅, e.g., aspirin

There are a number of words where a graphemic medial vowel is not generally pronounced ($V \rightarrow \emptyset$), although an alternate pronunciation with the vowel (unstressed, pronounced [ə]) is usually possible, even if over-precise. These unpronounced vowels are coded as general primary vowel Rule 32. Very of' they are in the environment /__r, e.g., every.

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 [sɪlvər], silvery [sɪlvri].

APPENDIX A

Key to Pronunciation and Symbols

Key to Pronunciation

The following phonetic symbols are used to indicate pronunciation. The symbols used in *Wester's New World Dictionary* (1957) are given on the right for reference.

| <u>Symbol</u> | <u>Key words (corresponding graphemes underlined)</u> | <u>Dictionary Symbol</u> |
|---------------|---|--------------------------------|
| Vowels | | |
| [i] | sc <u>e</u> ne, ne <u>a</u> t, se <u>e</u> , ch <u>i</u> ef | \bar{e} |
| [ɪ] | bit, hid <u>d</u> en | i |
| [e] | na <u>m</u> e, da <u>y</u> , th <u>e</u> y | \bar{a} |
| [ɛ] | g <u>e</u> t, he <u>a</u> d | e |
| [æ] | fa <u>t</u> , ba <u>d</u> | a |
| [ɑ] | h <u>o</u> t, ca <u>r</u> | o |
| [ɔ] | so <u>n</u> g, lo <u>s</u> s, ta <u>u</u> ght, la <u>w</u> n, ta <u>k</u> , ba <u>l</u> l, tho <u>u</u> ght | \hat{o} |
| [o] | bo <u>n</u> e, go <u>o</u> , fo <u>r</u> k, to <u>e</u> , bo <u>a</u> rd, kn <u>o</u> w | \bar{o} |
| [ʊ] | pu <u>t</u> , pu <u>s</u> h, bo <u>o</u> k, co <u>u</u> ld | oo |
| [u] | fo <u>o</u> d, de <u>w</u> , tu <u>n</u> e | \bar{oo} |
| [ə] | bu <u>t</u> , ab <u>o</u> ve | (unstressed) ə (stressed) u |
| [ay] | cr <u>y</u> , mi <u>n</u> e, di <u>e</u> | \bar{i} |
| [aw] | fo <u>u</u> nd, ow <u>l</u> | ou |
| [oy] | bo <u>y</u> , no <u>i</u> se | oi |

| <u>Symbol</u> | <u>Key words (corresponding graphemes underlined)</u> | <u>Dictionary Symbol</u> |
|---------------|--|--------------------------|
| Consonants | | |
| [b] | <u>b</u> oy, ca <u>b</u> | b |
| [ç] | <u>ch</u> urch, <u>ch</u> ip, ha <u>ch</u> | ch |
| [d] | <u>d</u> ead, <u>d</u> o | d |
| [f] | <u>f</u> un, <u>f</u> air, <u>off</u> | f |
| [g] | <u>g</u> o, <u>g</u> ay, <u>egg</u> | g |
| [h] | <u>h</u> ome, <u>h</u> ead | h |
| [j] | <u>j</u> udge, <u>g</u> em, <u>a</u> ge | j |
| [k] | <u>k</u> ill, <u>k</u> ick, <u>c</u> ome, <u>c</u> at | k |
| [l] | <u>l</u> et, <u>l</u> ittle | l |
| [m] | <u>m</u> an, ha <u>m</u> | m |
| [n] | <u>n</u> o, ha <u>nd</u> | n |
| [ŋ] | <u>s</u> ing, <u>s</u> ingle, thi <u>nk</u> | ŋ |
| [p] | <u>p</u> ull, tri <u>p</u> | p |
| [r] | <u>r</u> ed, fa <u>r</u> | r |
| [s] | <u>s</u> ee, <u>i</u> ce, mi <u>ss</u> | s |
| [ʃ] | <u>sh</u> e, <u>s</u> ure, <u>i</u> ss <u>ue</u> , na <u>ti</u> on, ha <u>sh</u> | sh |
| [t] | <u>t</u> en, hi <u>t</u> , li <u>k</u> ed | t |
| [v] | <u>v</u> ase, lo <u>v</u> e | v |
| [w] | <u>w</u> et, lan <u>gu</u> age, qu <u>ic</u> k | w |
| [y] | <u>y</u> et, <u>y</u> ou | y |
| [z] | <u>z</u> oo, la <u>z</u> y, ple <u>as</u> e, wi <u>v</u> es | z |
| [ʒ] | vi <u>si</u> on, tre <u>as</u> ure | zh |
| [θ] | <u>th</u> ing, ba <u>th</u> | th |
| [ð] | <u>th</u> em, ba <u>th</u> e | th |

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)

ɛ = 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 in boys.
- BISYLLABLE:** a two-syllable word.
- 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 aspirated [t^h] and unaspirated [t] are in complementary distribution, since the former occurs initially, while the latter never does. 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. Also called a consonant blend.
- 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 activity 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. Since such exceptions were coded "40," the words are sometimes known as "40 words." The term "irregular" refers to exceptions.

EXEMPLAR: a word containing a particular spelling-to-sound correspondence

40 WORDS: see EXCEPTION.

GEMINATE CONSONANTS: see DOUBLE CONSONANTS.

GRAPHEME: a unit of an alphabet; a letter. For English, any of the 26 letters.

GRAPHEME UNIT: one or more letters (graphemes) 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 ft. Cf, PHONOTACTICS.

IRREGULAR: see EXCEPTIONS.

LONG VOWELS: the sounds [e, i, ay, o, (y)u].

MONOSYLLABLE: a one-syllable word.

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 [ʃ, ʒ, ʧ, ʝ] 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 [it]. 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 independent 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 Ø). 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 is spelling-to-sound correspondences in 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 (ˈ), e.g., accommodate. 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 printers manuals. In this report, syllable division is indicated only in clear-cut cases when necessary for interpretation of the rules of correspondence.

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, ɒ, z, ʒ, ʃ, m, n, ŋ, r, l, w, y]. The voiceless consonants [p, t, k, f, θ, s, ʃ, ʒ, 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

Spelling-to-Sound Correspondences:
Rule Description, Exemplars, Position in Sequence

Spelling-to-sound correspondences for primary vowels

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|---|------------------------|-----------------------------|
| A | 11 | a → [e] / __Ce# | name, brave | 6,1 |
| | 12 | a → [e] / __Ct ^r]e# | acre, stable | 25,4 |
| | 13 | a → [e] / __CV | baby, nature | 18,i |
| | 14 | a → [e] / __Ct ^r]V | April, fragrant | 25,5 |
| | 15 | a → [æ] / __C(C)# | sat, fast | 1,1 |
| | 16 | a → [æ] / __CC.... | saddle, jacket | 8,2 |
| | 17 | a → [ə], [ɪ] in unstressed syllables | above, final | 10,1 |
| | 21 | a → [ɑ] / __{ ^r C r#} | cart, car | 9,1 |
| | 22 | a → [ɪ], [æ] / __r | vary, marry | 18,3 |
| | 23 | a → [ɔ] / __ $\begin{cases} (ll) \\ lk \\ lt \\ ld \end{cases}$ | ball, walk, salt, bald | 13,2 |
| | 24 | a → [ɑ], [ɔ] / $\begin{cases} w \\ u \end{cases}$ __ | wad, squat | 23,1 |
| | 25 | a → [o] / $\begin{cases} wh \\ w \\ qu \end{cases}$ __r | wharf, war, quart | 9,3 |

For further description of these rules and of the rule notation, see Berdiansky, Cronnell and Koehler (1969), Cronnell (1971), and Section III of this report. Asterisked rules do not appear in the earlier reports.

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|--------------------|--|--|-----------------------------|
| A | 26 | a → [e] / __-V | mosa <u>a</u> ic | 25,2 |
| | 27* | a → [æ] / __ C ity | human <u>a</u> ity, capac <u>a</u> ity | 24,4 |
| | 28* | a → [æ] / __ C $\left\{ \begin{array}{l} ic \\ id \\ ish \\ it \end{array} \right\}$ | mag <u>a</u> ic, rap <u>a</u> id, rad <u>a</u> ish, hab <u>a</u> it | 24,3 |
| | 29 | a → [e] / __ $\left\{ \begin{array}{l} nge \\ ste \end{array} \right\} \#$ | strang <u>e</u> , past <u>e</u> | 23,1 |
| | 32 | a → ∅ | separ <u>a</u> te | 27,6 |
| | 38 | a → [æ] / __ $\left\{ \begin{array}{l} vV \\ x(1)V \end{array} \right\}$ | cav <u>a</u> rn, ax <u>a</u> is ax <u>a</u> le | 24,2 |
| E | 11 | e → [i] / __Ce# | sc <u>e</u> ne, her <u>e</u> | 6,2 |
| | 13 | e → [i] / __CV | her <u>e</u> , met <u>e</u> r | 18,1 |
| | 14 | e → [i] / __C $\left\{ \begin{array}{l} r \\ l \end{array} \right\} V$ | zeb <u>e</u> ra, decl <u>e</u> are | 25,5 |
| | 15 | e → [ɛ] / __C(C)# | set <u>e</u> , felt <u>e</u> | 1,4 |
| | 16 | e → [ɛ] / __CC.... | edg <u>e</u> , extr <u>e</u> | 8,2 |
| | 17 | e → [ə], [ɪ] in unstressed syllables | hidd <u>e</u> n, tal <u>e</u> nt, magn <u>e</u> t | 10,1 |
| | 18 | e → ∅ / __# | nam <u>e</u> , edg <u>e</u> , immens <u>e</u> , mic <u>e</u> | 6,1 |
| | 19 | e → ∅ / __ $\left\{ \begin{array}{l} s \\ d \end{array} \right\}$ | arm <u>e</u> d, wiv <u>e</u> s | --- ¹⁰ |
| | 21 | e → [ə] / __ $\left\{ \begin{array}{l} rC \\ r\# \end{array} \right\}$ | her <u>e</u> d, fat <u>e</u> ther | 9,1 |
| | 25 | e → [i] / # (C)C __# | w <u>e</u> , sh <u>e</u> | 3,1 |
| | 26 | e → [i] / __-V | creat <u>e</u> , me <u>ow</u> | 25,2 |
| 27* | e → [ɛ] / __ C ity | prosper <u>e</u> ty | 24,4 | |

¹⁰ Not taught explicitly as a correspondence rule.

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---|---|---|-----------------------------|
| E | 28: | $e \rightarrow [i] / _C \begin{cases} ic \\ id \\ ish \\ it \end{cases}$ | re <u>l</u> ic, che <u>r</u> ish cre <u>d</u> it | 24,3 |
| | 32 | $e \rightarrow \emptyset$ | differe <u>n</u> ce, seve <u>r</u> al | 27,6 |
| | 38 | $e \rightarrow [i] / _x \begin{matrix} vV \\ (l)V \end{matrix}$ | cle <u>v</u> er, e <u>x</u> it | 25, |
| I | 11 | $i \rightarrow [ay] / _Ce$ | fi <u>n</u> e, li <u>k</u> e | 6,1 |
| | 12 | $i \rightarrow [ay] / _C \begin{cases} r \\ l \end{cases} e \#$ | ti <u>t</u> le, i <u>d</u> le | 25,4 |
| | 13 | $i \rightarrow [ay] / _CV$ | pi <u>l</u> ot, ci <u>d</u> er | 18,1 |
| | 14 | $i \rightarrow [ay] / _C \begin{cases} r \\ l \end{cases} V$ | mi <u>g</u> rate, i <u>d</u> ly | 25,5 |
| | 15 | $i \rightarrow [i] / _C(C) \#$ | si <u>t</u> , mi <u>l</u> k | 1,1 |
| | 16 | $i \rightarrow [i] / _CC \dots$ | hi <u>dd</u> en, li <u>tt</u> le | 8,2 |
| | 17 | $i \rightarrow [u], [i] \text{ in unstressed syllables}$ | mi <u>ss</u> ile, offi <u>ce</u> | 10,1 |
| | 21 | $i \rightarrow [u] / _ \begin{cases} rC \\ r \# \end{cases}$ | bi <u>r</u> d, si <u>r</u> | 3,1 |
| | 22 | $i \rightarrow [ay] / _ \begin{cases} nd \\ ld \\ gn \end{cases} \#$ | fi <u>nd</u> , wi <u>ld</u> , si <u>gn</u> | 13,3 |
| | 24 | $i \rightarrow [ay] / _gh$ | hi <u>gh</u> , ri <u>gh</u> t | 19,2 |
| | 25 | $i \rightarrow [y] / C _VC$ | mi <u>ll</u> ion, on <u>i</u> on | 23,2 |
| | 26 | $i \rightarrow [ay] / _ _V$ | li <u>ar</u> , di <u>et</u> | 25,2 |
| 27: | $i \rightarrow [i] / _C \text{ity}$ | hu <u>m</u> idity, cap <u>t</u> ivity | 24,4 | |
| 28: | $i \rightarrow [i] / _C \begin{cases} ic \\ id \\ ish \\ it \end{cases}$ | cli <u>n</u> ic, ti <u>m</u> id, fi <u>n</u> ish, li <u>m</u> it | 24,3 | |

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|---|--|-----------------------------|
| I | 32 | i → ∅ | aspir <u>i</u> n | 27,6 |
| | 35* | i → [i] | pol <u>i</u> ce, sk <u>i</u> | 23,2 |
| | 36* | i → [ɪ] / __ -V | rad <u>i</u> o, per <u>i</u> od | 25,3 |
| | 38 | i → [ɪ] / __ { ^v _x (l)V} | c <u>i</u> vic, r <u>i</u> ver | 24,2 |
| O | 11 | o → [o] / __Ce# | h <u>o</u> me, sm <u>o</u> ke | 6,2 |
| | 12 | o → [o] / __C{ ^r _l re# | og <u>o</u> re, nob <u>l</u> e | 25,4 |
| | 13 | o → [o] / __CV | not <u>ic</u> e, od <u>o</u> r | 18,1 |
| | 14 | o → [o] / __C{ ^r _l }V | ok <u>o</u> ra, on <u>l</u> y | 25,5 |
| | 15 | o → [a] / __C(C)# | l <u>o</u> t, l <u>o</u> ck | 1,6 |
| | 16 | o → [a] / __CC.... | mot <u>o</u> , hock <u>e</u> y | 8,2 |
| | 17 | o → [ə], [ɪ] in unstressed syllables | cot <u>o</u> n, sail <u>o</u> r | 10,1 |
| | 21 | o → [ɔ], [ɒ], [a] / __r | h <u>o</u> rn, tort <u>o</u> ise | 9,1 |
| | 22 | o → [ə] / w__rC | w <u>o</u> rd, w <u>o</u> rth | 9,3 |
| | 23 | o → [o] / __lC# | rol <u>l</u> , gol <u>d</u> , yol <u>k</u> , bol <u>t</u> | 13,2 |
| | 24 | o → [ɔ], [a] / __ { ^{fC} _{ng} ss st th g# | off, soft <u>o</u> n, s <u>o</u> ng, moss, lost, m <u>o</u> th, dog | 13,3 |
| | 25 | o → [o] / __# | g <u>o</u> , mot <u>o</u> | 18,4 |
| | 26 | o → [o] / __-V | po <u>o</u> m | 25,2 |
| | 28* | o → [a] / __C { ^{ic} _{id} ish it | phon <u>o</u> ics, sol <u>id</u> , abol <u>o</u> ish, prof <u>o</u> it | 24,3 |

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| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|---|--|-------------------------------|
| O | 31 | o → [ə] | w <u>o</u> n, m <u>o</u> ther, s <u>o</u> me, f <u>o</u> ve | 13,1 |
| | 32 | o → ∅ | soph <u>o</u> more, lic <u>o</u> rice | 27,6 |
| | 38 | o → [ə] / <u> </u> ^{VV} x(l)V | nov <u>e</u> l, ox <u>e</u> n | 24,2 |
| U | 11 | u → [(y)u] / <u> </u> Ce# | u <u>s</u> e, cru <u>d</u> e | 6,2 |
| | 12 | u → [(y)u] / <u> </u> C{ ^r }_e# | bug <u>l</u> e | 25,4 |
| | 13 | u → [(y)u] / <u> </u> CV | u <u>n</u> it, crus <u>a</u> de | 18,1 |
| | 14 | u → [(y)u] / <u> </u> C{ ^r }_V | bug <u>l</u> er | 25,5 |
| | 15 | u → [ə] / <u> </u> C(C)# | g <u>u</u> m, fu <u>s</u> s | 1,6 |
| | 16 | u → [ə] / <u> </u> CC.... | sudd <u>e</u> n, just <u>i</u> ce. | 8,2 |
| | 17 | u → [ə], [ɪ] in unstressed syllables | lett <u>u</u> ce, min <u>u</u> te | 10,1 |
| | 20 | u → ∅ / #g <u> </u> V | g <u>e</u> st, g <u>a</u> rd | 19,6 |
| | 21 | u → [ə] / <u> </u> r | f <u>u</u> r, b <u>u</u> rn | 9,1 |
| | 26 | u → [(,y)u] / <u> </u> -V | flu <u>u</u> d, ru <u>u</u> n | 25,6 |
| U | 31 | u → [u] | bu <u>ll</u> , pu <u>sh</u> , pu <u>t</u> | 13,1 |
| | 32 | u → ∅ | natur <u>u</u> l | 27,6 |
| | Y | 11 | y → [ay] / <u> </u> Ce# | rh <u>y</u> me, t <u>y</u> pe |
| Y | 12 | y → [ay] / <u> </u> C{ ^r }_e# | cy <u>cl</u> e | 25,4 |
| Y | 13 | y → [ay] / <u> </u> CV | ty <u>ra</u> nt, p <u>ap</u> yrus | 23,3 |
| Y | 14 | y → [ay] / <u> </u> C{ ^r }_V | cy <u>cl</u> one, hyd <u>ra</u> nt | 25,5 |
| Y | 15 | y → [ɪ] / <u> </u> C(C)# | my <u>th</u> , gym | 23,3 |

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|---|-----------------|-----------------------------|
| Y | 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 → [ɪ] / __C $\left\{ \begin{array}{l} ic \\ id \\ ish \\ it \end{array} \right\}$ | physic | 24,3 |
| | 36* | y → [ɪ] / __-V | Tokyo | 25,3 |

Spelling-to-sound correspondences for secondary vowels

| | | | | |
|----|----|---|-----------------------|------|
| 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 | 6,4 |
| AY | 10 | ay → [e] | day, play | 12,1 |
| EA | 11 | ea → [ɪ] | 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 → [i] | receive, ceiling | 26,5 |
| | 20 | ei → [e] / __ $\left\{ \begin{array}{l} gn \\ n \\ gh \end{array} \right\}$ | reign, rein, neighbor | 26,6 |

| <u>Grapheme Unit</u> | <u>Rule</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|-------------|--|---|-----------------------------|
| EW | 10 | ew → [(y)u] | <u>few</u> , <u>new</u> | 16,6 |
| EY | 10 | ey → [e] | <u>they</u> , <u>obey</u> | 26,6 |
| | 17 | ey → [ɪ] in unstressed syllables | <u>donkey</u> , <u>money</u> | 26,2 |
| IE | 11 | ie → [aɪ] / __# | <u>die</u> , <u>lie</u> | 19,2 |
| | 12 | ie → [i] / __.... | <u>field</u> , <u>grief</u> | 2, 5 |
| | 17 | ie → [ɪ] / __# in unstressed syllables | <u>collie</u> , <u>movie</u> | 26,2 |
| OA | 10 | oa → [o] | <u>load</u> , <u>boat</u> | 16,3 |
| OE | 10 | oe → [o] / __# | <u>hoe</u> , <u>toe</u> | 16,3 |
| OI | 10 | oi → [ɔɪ] | <u>noise</u> , <u>join</u> | 16,5 |
| OO | 11 | oo → [u] | <u>broom</u> , <u>tool</u> | 12,3 |
| | 12 | oo → [ʊ] | <u>book</u> , <u>wood</u> | 12,3 |
| OU | 10 | ou → [aʊ] | <u>count</u> , <u>mountain</u> | 16,2 |
| | 31 | ou → [ʊ] | <u>couple</u> , <u>young</u> | 26,7 |
| | 33 | ou → [(y)u] | <u>through</u> , <u>group</u> | 26,7 |
| | 34 | ou → [ʊ] | <u>fought</u> , <u>thought</u> | 26,7 |
| | 35 | ou → [ɔ] | <u>soul</u> , <u>though</u> | 26,7 |
| OW | 11 | ow → [oʊ] | <u>glow</u> , <u>below</u> , <u>own</u> , <u>bow</u> | 12,4 |
| | 12 | ow → [aʊ] | <u>now</u> , <u>allow</u> , <u>owl</u> , <u>bow</u> | 12,4 |
| OY | 10 | oy → [ɔɪ] | <u>boy</u> , <u>toy</u> | 16,5 |
| UE | 10 | ue → [(y)u] | <u>blue</u> , <u>argue</u> | 16,6 |
| UI | 10 | ui → [(y)u] | <u>fruit</u> , <u>juice</u> | 16,6 |
| | 31 | ui → [ɪ] | <u>build</u> , <u>biscuit</u> | 26,8 |

Spelling-to-sound correspondences for consonants

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|---|---|-----------------------------|
| B | 10 | b → [b] | <u>boy</u> , <u>cub</u> , <u>number</u> | 1,5 |
| | 20 | b → ∅ /m__# | <u>climb</u> , <u>comb</u> | 19,4 |
| BB | 10 | bb → [b] | <u>bubble</u> , <u>blubber</u> | 1,5 (9,2) ¹¹ |
| C | 11 | c → [s] / __ { e i y | <u>city</u> , <u>lace</u> , <u>fancy</u> | 7,1 |
| | 12 | c → [k] / __ { a o u C # | <u>cat</u> , <u>come</u> , <u>cut</u> <u>cream</u> , <u>picnic</u> , <u>scare</u> | 4,2 |
| CC | 11* | cc → [ks] / __ { e i y | <u>accent</u> , <u>succeed</u> | 20,4 |
| | 12 | cc → [k] / __ { a o u | <u>yucca</u> , <u>account</u> , <u>accuse</u> | 11,5 |
| CH | 10 | ch → [ç] | <u>cheap</u> , <u>church</u> | 11,2 |
| | 31 | ch → [k] | <u>ache</u> , <u>school</u> , <u>chord</u> , <u>Christ</u> | 20,2 |
| CK | 10 | ck → [k] | <u>kick</u> , <u>pack</u> | 4,2 |
| D | 10 | d → [d] | <u>dead</u> , <u>needle</u> | 1,4 |
| DD | 10 | dd → [d] | <u>hidden</u> , <u>sudden</u> | 1,4 |
| F | 10 | f → [f] | <u>fat</u> , <u>after</u> | 4,1 |
| FF | 10 | ff → [f] | <u>off</u> , <u>taffy</u> | 4,1 |

¹¹The unit in parentheses after some double consonant rules indicates the first actual occurrence.

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| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|---|--|-----------------------------|
| G | 11 | $g \rightarrow [j] / \underline{\quad} \begin{cases} e \\ i \\ y \end{cases}$ | <u>g</u> em, <u>a</u> ge, <u>g</u> in, <u>g</u> ypsy | 7,1 |
| | 12 | $g \rightarrow [g] / \underline{\quad} \begin{cases} a \\ o \\ u \\ C \\ \# \end{cases}$ | <u>g</u> ave, <u>g</u> o, <u>g</u> um, <u>g</u> reen, <u>b</u> ag | 4,3 |
| | 20* | $g \rightarrow \emptyset / \begin{cases} \# \underline{\quad} n \\ \underline{\quad} n \# \end{cases}$ | <u>g</u> naw, <u>s</u> ign | 19,3 |
| | 31 | $g \rightarrow [g]$ | <u>g</u> et, <u>g</u> irl | 11,6 |
| GG | 10 | $gg \rightarrow [g]$ | <u>e</u> gg, <u>w</u> igg <u>l</u> e | 11,5 |
| GH | 10 | $gh \rightarrow \emptyset$ | <u>th</u> ough, <u>ta</u> ught, <u>h</u> igh | 19,2 |
| H | 10 | $h \rightarrow [h]$ | <u>h</u> ome, <u>a</u> head | 1,6 |
| | 20 | $h \rightarrow \emptyset$ | <u>r</u> ajah, <u>h</u> our | 19,2 |
| J | 10 | $j \rightarrow [j]$ | <u>j</u> oy, <u>j</u> udge | 4,4 |
| K | 10 | $k \rightarrow [k]$ | <u>m</u> ilk, <u>k</u> ill | 4,1 |
| | 20 | $k \rightarrow \emptyset / \# \underline{\quad} n$ | <u>k</u> now, <u>k</u> not | 19,3 |
| L | 10 | $l \rightarrow [l]$ | <u>l</u> ike, <u>m</u> ile | 1,3 |
| | 20 | $l \rightarrow \emptyset / \begin{cases} o \underline{\quad} k \\ a \underline{\quad} f \\ a \underline{\quad} k \\ a \underline{\quad} m \\ a \underline{\quad} v \end{cases}$ | <u>y</u> olk, <u>f</u> olk, <u>h</u> alf, <u>c</u> alf, <u>v</u> alk, <u>s</u> talk, <u>p</u> alm, <u>c</u> alm, <u>c</u> alves, <u>s</u> alve | 19,5 |
| LE | 22 | $le \rightarrow [əl] / C \underline{\quad} \#$ | <u>l</u> ittle, <u>s</u> tabl <u>e</u> | 10,2 |
| LL | 10 | $ll \rightarrow [l]$ | <u>b</u> ull <u>e</u> t, <u>f</u> ill | 1,3 |
| M | 10 | $m \rightarrow [m]$ | <u>m</u> an, <u>c</u> ame | 1,5 |
| MM | 10 | $mm \rightarrow [m]$ | <u>s</u> umm <u>e</u> r, <u>m</u> amm <u>a</u> l | 1,5 (9,2) |
| N | 10 | $n \rightarrow [n]$ | <u>n</u> o, <u>n</u> ine, <u>f</u> un | 1,1 |

| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|--|---|-----------------------------|
| N | 20 | $n \rightarrow [ŋ] / \left\{ \begin{array}{l} x \\ k \\ qu \\ g \text{ pronounced } [g] \\ c \text{ pronounced } [k] \end{array} \right\}$ | anxious, th <u>an</u> k, s <u>in</u> k, ban <u>qu</u> et, s <u>in</u> gle, fun <u>g</u> us, f <u>in</u> ger, Lin <u>co</u> ln | 4,1 |
| NG | 10 | $ng \rightarrow [ŋ] / _ \#$ | ring, song | 5,5 |
| NN | 10 | $nn \rightarrow [n]$ | inner, funny | 1,1 |
| P | 10 | $p \rightarrow [p]$ | people, pop | 1,2 |
| PP | 10 | $pp \rightarrow [p]$ | pepper, apple | 1,2 (9,2) |
| PH | 10 | $ph \rightarrow [t]$ | phone, photo | 20,2 |
| QU | 10 | $qu \rightarrow [kw]$ | quick, banquet | 11,4 |
| R | 10 | $r \rightarrow [r]$ | run, far | 1,6 |
| RR | 10 | $rr \rightarrow [r]$ | hurry, marriage | 1,6 (9,1) |
| S | 10 | $s \rightarrow [s]$ | sun, fast, horse | 1,3 |
| | 20 | $s \rightarrow [z] / V _ V$ | nose, easy | 18,2 |
| | 21 | $s \rightarrow [s] / \left\{ \begin{array}{l} ou \\ oo \\ ea \\ a \end{array} \right\} _ e$ | house, moose, lease, case | 18,2 |
| | 31 | $s \rightarrow [z] / _ \#$ | trousers, wives, riches | --- |
| SH | 10 | $sh \rightarrow [ʃ]$ | shoe, rush | 2,1 |
| SS | 10 | $ss \rightarrow [s]$ | mess, misse | 1,3 |

¹Not explicitly taught as a correspondence rule.

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| <u>Grapheme Unit</u> | <u>Rule #</u> | <u>Rule Description</u> | <u>Examples</u> | <u>Position in sequence</u> |
|----------------------|---------------|---|---|-----------------------------|
| T | 10 | t → [t] | <u>title</u> , <u>let</u> | 2,1 |
| | 20 | t → Ø / (s__le#) s__en# f__en# | w <u>restle</u> , <u>fasten</u> , <u>often</u> | 19,5 |
| TCH | 10 | tch → [tʃ] | <u>match</u> , <u>notch</u> | 11,2 |
| TH | 11 | th → [θ] | <u>thin</u> , <u>bath</u> | 2,2 |
| | 12 | th → [ð] / (e) __er (ern) | <u>bathe</u> , <u>father</u> , <u>northern</u> | 20,3 |
| | 13 | th → [ð] in pronouns, conjunctions, and function words. | <u>they</u> , <u>although</u> , <u>the</u> | 2,1 |
| TT | 10 | tt → [t] | <u>little</u> , <u>mitt</u> | 1,1 (9,2) |
| V | 10 | v → [v] | <u>vase</u> , <u>love</u> | 4,5 |
| W | 10 | w → [w] | <u>wet</u> , <u>beware</u> | 4,1 |
| | 20 | w → Ø / #__r | <u>w</u> n, <u>w</u> rong | 19,3 |
| WH | 10 | wh → [hw] or [w] | <u>when</u> , <u>whether</u> | 11,2 |
| X | 10 | x → [ks] | <u>box</u> , <u>oxen</u> | 4,4 |
| Y | 10 | y → [j] | <u>yet</u> , <u>beyond</u> | 4,4 |
| Z | 10 | z → [z] | <u>zoo</u> , <u>lazy</u> | 4,5 |
| ZZ | 10 | zz → [z] | <u>buzz</u> , <u>fuzzy</u> | 4,5 (10,1) |

APPENDIX D

ALPHABETICAL LIST OF RULES AND PRONUNCIATIONS

| Grapheme Unit | Rule Number | Pronunciation | Position in sequence | Grapheme Unit | Rule Number | Pronunciation | Position in sequence | | | |
|---------------|-------------|---------------|----------------------|---------------|-------------|---------------|----------------------|------|----------|------|
| A | 11 | [e] | 6,1 | CK | 10 | [k] | 4,2 | | | |
| | 12 | [e] | 25,4 | | D | 10 | [d] | 1,4 | | |
| | 13 | [e] | 18,1 | | | DD | 10 | [d] | 1,4 | |
| | 14 | [e] | 25,5 | | | | E | 11 | [i] | 6,2 |
| | 15 | [æ] | 1,1 | | | | | 13 | [i] | 18,1 |
| | 16 | [æ] | 8,2 | | | | | 14 | [i] | 25,5 |
| | 17 | [ə], [ɪ] | 10,1 | | | | | 15 | [ɔ] | 1,4 |
| | 21 | [a] | 9,1 | | | | | 16 | [ɛ] | 8,2 |
| | 22 | [ɛ], [æ] | 18,3 | | | | | 17 | [ə], [ɪ] | 10,1 |
| | 23 | [ɔ] | 13,2 | | | | | 18 | ∅ | 6,1 |
| | 24 | [a], [ɔ] | 23,1 | | | | | 21 | [ə] | 9,1 |
| | 25 | [o] | 9,3 | | | | | 25 | [i] | 3,1 |
| | 26 | [e] | 25,2 | | | | | 26 | [i] | 25,2 |
| | 27 | [æ] | 24,4 | | | | | 27 | [ɛ] | 24,4 |
| | 28 | [æ] | 24,3 | | | | | 28 | [ɛ] | 24,3 |
| | 29 | [ɛ] | 23,1 | | | | | 32 | ∅ | 27,6 |
| | 32 | ∅ | 27,6 | | | | | 38 | [ɛ] | 25,2 |
| 38 | [ɛ] | 24,2 | EA | 11 | | | | [i] | 12,2 | |
| AI | 10 | [e] | | 16,1 | 31 | | | [ɛ] | 12,2 | |
| | 17 | [ɔ], [ɪ] | | 26,3 | 33 | [ə] | | 26,4 | | |
| AU | 10 | [ɔ] | 16,4 | EE | 10 | [i] | 3,1 | | | |
| AW | 10 | [ɔ] | 16,4 | | EI | 10 | [i] | 26,5 | | |
| Ar | 10 | [e] | 12,1 | 20 | | [e] | 26,6 | | | |
| B | 10 | [b] | 1,5 | EW | 10 | [(y)u] | 16,6 | | | |
| | 20 | ∅ | 19,4 | | EY | 10 | [e] | 26,6 | | |
| BB | 10 | [b] | 1,5 | 17 | | [i] | 26,2 | | | |
| C | 11 | [s] | 7,1 | F | 10 | [f] | 4,1 | | | |
| | 12 | [k] | 4,2 | | FF | 10 | [f] | 4,1 | | |
| CC | 11 | [fɪs] | 20,4 | G | | 11 | [j] | 7,1 | | |
| | 12 | [f] | 11,5 | | 12 | [g] | 4,3 | | | |
| CH | 10 | [ʃ] | 11,2 | | 20 | ∅ | 19,3 | | | |
| | 31 | [f] | 20,2 | | 31 | [g] | 11,6 | | | |

| Grapheme Unit | Rule Number | Pronunciation | Position in sequence | Grapheme Unit | Rule Number | Pronunciation | Position in sequence | |
|---------------|-------------|---------------|----------------------|---------------|-------------|---------------|----------------------|------|
| GG | 10 | [g] | 11,5 | NG | 10 | [ŋ] | 5,5 | |
| GH | 10 | ∅ | 19,2 | NN | 10 | [n] | 1,1 | |
| H | 10 | [h] | 1,6 | O | 11 | [o] | 6,2 | |
| | 20 | ∅ | 19,2 | | 12 | [o] | 25,4 | |
| I | 11 | [ay] | 6,1 | | 13 | [o] | 18,1 | |
| | 12 | [ay] | 25,4 | | 14 | [o] | 25,5 | |
| | 13 | [ay] | 18,1 | | 15 | [a] | 1,6 | |
| | 14 | [ay] | 25,5 | | 16 | [ɜ] | 8,2 | |
| | 15 | [ɪ] | 1,1 | | 17 | [ə], [ɪ] | 10,1 | |
| | 16 | [ɪ] | 8,2 | | 21 | [o], [ɔ], [ɜ] | 9,1 | |
| | 17 | [ə], [ɪ] | 10,1 | | 22 | [ə] | 9,3 | |
| | 21 | [ə] | 9,1 | | 23 | [o] | 13,2 | |
| | 22 | [ay] | 13,3 | | 24 | [ɔ], [a] | 13,3 | |
| | 24 | [ay] | 19,2 | | 25 | [u] | 18,4 | |
| | 25 | [y] | 23,2 | | 26 | [o] | 25,2 | |
| | 26 | [ay] | 25,2 | | 28 | [a] | 24,3 | |
| | 27 | [ɪ] | 24,4 | | 31 | [ə] | 13,1 | |
| | 28 | [ɪ] | 24,3 | | 32 | ∅ | 27,6 | |
| | 32 | ∅ | 27,6 | | 38 | [a] | 24,2 | |
| | 35 | [ɪ] | 23,2 | | OA | 10 | [o] | 16,3 |
| | 36 | [ɪ] | 25,3 | | | OE | 10 | [o] |
| | 38 | [ɪ] | 24,2 | | OI | | 10 | [oy] |
| IE | 11 | [ay] | 19,2 | | | OO | 11 | [u] |
| | 12 | [ɪ] | 26,5 | 12 | [u] | | 12,3 | |
| | 17 | [ɪ] | 26,2 | OU | 10 | [aw] | 16,2 | |
| J | 10 | [j] | 4,4 | | 31 | [oʊ] | 26,7 | |
| | K | 10 | [k] | | 4,1 | 33 | [(y)u] | 26,7 |
| 20 | | ∅ | 19,3 | | 34 | [o] | 26,7 | |
| L | | 10 | [l] | | 1,3 | 35 | [o] | 26,7 |
| | 20 | ∅ | 19,5 | OW | 11 | [o] | 12,4 | |
| LE | 22 | [ɔɪ] | 10,2 | | 12 | [aw] | 12,4 | |
| | LL | 10 | [l] | 1,3 | OY | 10 | [oy] | 16,5 |
| M | | 10 | [m] | 1,5 | | P | 10 | [p] |
| | MM | 10 | [m] | 1,5 | PH | | 10 | [f] |
| N | | 10 | [n] | 5,5 | | PP | 10 | [p] |
| | 20 | [ŋ] | 4,1 | | | | | |

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| Grapheme Unit | Rule Number | Pronunciation | Position in sequence | Grapheme Unit | Rule Number | Pronunciation | Position in sequence |
|---------------|-------------|---------------|----------------------|---------------|-------------|---------------|----------------------|
| QU | 10 | [kw] | 11,4 | WH | 10 | [hw], [w] | 11,3 |
| R | 10 | [r] | 1,6 | X | 10 | [ks] | 4,4 |
| RR | 10 | [r] | 1,6 | Y | 10 | [y] | 4,4 |
| S | 10 | [s] | 1,3 | | 11 | [ay] | 23,3 |
| | 20 | [z] | 18,2 | | 12 | [ay] | 25,4 |
| | 21 | [s] | 18,2 | | 13 | [ay] | 23,3 |
| | | | | | 14 | [ay] | 25,5 |
| SH | 10 | [ʃ] | 2,1 | | 15 | [ɪ] | 23,3 |
| | | | | | 16 | [ɪ] | 23,3 |
| SS | 10 | [s] | 1,3 | | 17 | [i], [ɪ] | 10,2 |
| | | | | | 19 | [ay] | 3,2 |
| T | 10 | [t] | 1,1 | | 26 | [ay] | 25,2 |
| | 20 | ∅ | 19,5 | | 28 | [ɪ] | 24,3 |
| | | | | | 36 | [i] | 25,3 |
| TCH | 10 | [tʃ] | 11,2 | Z | 10 | [z] | 4,5 |
| TH | 11 | [θ] | 2,2 | ZZ | 10 | [z] | 4,5 |
| | 12 | [ð] | 20,3 | | | | |
| | 13 | [θ] | 2,1 | | | | |
| TT | 10 | [t] | 1,1 | | | | |
| U | 11 | [(y)u] | 6,2 | | | | |
| | 12 | [(y)u] | 25,4 | | | | |
| | 13 | [(y)u] | 18,1 | | | | |
| | 14 | [(y)u] | 25,5 | | | | |
| | 15 | [ə] | 1,6 | | | | |
| | 16 | [ə] | 8,2 | | | | |
| | 17 | [ə], [ɪ] | 10,1 | | | | |
| | 20 | ∅ | 19,6 | | | | |
| | 21 | [ə] | 9,1 | | | | |
| | 26 | [(y)u] | 25,6 | | | | |
| | 31 | [u] | 13,1 | | | | |
| | 32 | ∅ | 27,6 | | | | |
| UE | 10 | [(y)u] | 16,6 | | | | |
| UI | 10 | [(y)u] | 16,6 | | | | |
| | 31 | [ɪ] | 28,8 | | | | |
| V | 10 | [v] | 4,5 | | | | |
| W | 10 | [w] | 4,1 | | | | |
| | 20 | ∅ | 19,3 | | | | |

APPENDIX E



SOUTHWEST REGIONAL LABORATORY
DEVELOPMENT MEMORANDUM

DM9
DATE April 17, 1969
RELEASE Howard J. Sullivan *HS*

CONTENT AND SEQUENCE FOR BLOCK I OF THE 1970 READING PROGRAM
Betty Berdiansky and George Stanton

Previous work has led to identification of an extensive lexicon upon which the SWRL 1970 primary-grade reading program will be based, as well as to the development of a considerable number of sound-symbol correspondence rules (see Berdiansky, Cronnell, and Koehler, 1969). The present document describes the initial steps taken in the development of a complete sequencing of these rules. This sequencing procedure is being based, in general, on the Desberg and Cronnell (1969) analysis of the characteristics of the rules. For the first block of this sequence, the rules were ordered primarily on the basis of their combined productivity, i.e., the number of words from the given lexicon which can be generated by the given combination of rules. The sequencing of rules and the listing of resultant useable words is covered in this report for the first block of rules only. Within- and across-block sequencing has not yet been entirely completed.

The Desberg and Cronnell paper categorizes grapheme-phoneme rules of correspondence into 17 sequenced blocks according to classification and sequencing rationales described by the authors of the paper. These rationales will not be discussed in this report at any greater length than is necessary to indicate the reasoning behind specific modifications of the Desberg and Cronnell sequence. Following are the steps gone through by the staff in their decisions on rule sequencing.

Step 1. The Desberg and Cronnell paper combined consonant rules, primary vowel rules, and secondary vowel rules into homogeneous groupings (Blocks). The Block I consonant rules: S10, N10, M10, R10, L10, T10, D10, P10, B10, and the Block I primary vowel rules: I15, A15, E15, U15, O15, (the "short vowels") were selected and assigned to initial blocks because of their high frequency and regularity. The initial block of the secondary vowel rules consisted only of Rule EE10. It was designated to Block I because it was the most regular secondary vowel rule, although the second most frequent. In the earliest stages of this program, rule regularity was seen as more crucial than rule frequency.

Step 2. The Rule 15 printout for each vowel and the Rule EE10 printout were consulted, and those words which were composed of only those vowels and consonants comprising Block I were listed. Also, the "40-words" sub-group ("40 words" are words containing at least one irregular grapheme - phoneme correspondence) for each of these regular vowel rules was examined, and a separate list was made of words containing a Block I grapheme's 40 rule in addition to the regular Block I rules. Then the I40, A40, E40, U40, O40, and EE40 printouts were consulted, and words containing the assigned consonants and vowels operating under Block I regular or 40 rules were listed. Only the vowel-rule

printouts had to be consulted, since they included all the words which would have been in any of the consonant-rule printouts. Given below is an example of the format used for listing the words selected from the printouts:

| | | | |
|--|-----------------------------|-----------------------------|-----------------------------|
| | <u>A15</u> | | <u>A40</u> |
| | non-40s | 40s | <u>1 syl.</u> <u>2 syl.</u> |
| | <u>1 syl.</u> <u>2 syl.</u> | <u>1 syl.</u> <u>2 syl.</u> | |

Step 3. For each vowel-rule, a cumulative chart was constructed, (i.e., each word entry occurs as soon as all component letters of the word are listed, but not before). This chart used the Desberg and Cronnell consonant Block I sequence: S, N, M, R, L, T, D, P, B; which was based on the idea that, since continuants blend easier than stops, it would be best to use them at the outset of instruction. The chart showed the order of occurrence of these words which could be taught from the Block I vowel and Block I consonant rules. It also showed the rules prerequisite to teaching a given word, provided the rules were taught in this order. For example, for the primary vowel Rule 015, the cumulative list of possible words from the consonant-10 rules S, N, M, R, L, and T was as follows:

| | | | | | |
|---|------------------------------------|---------|-----------------|--|-----------------|
| | <u>non 40s</u> | | <u>40s</u> | | <u>040s</u> |
| | 1 syl. 2 syl. | | 1 syl. 2 syl. | | 1 syl. 2 svl. |
| S | | | | | |
| N | | | | | |
| M | mom | | | | |
| R | | | | | |
| L | | | | | sol |
| T | lot, not rot, slot tot, trot | tom-tom | | | |

Step 4. When charts for all vowel-15 rules, with the consonants ordered S, N and so forth, were inspected, the resulting words-per-rule ratio was quite low in the early steps of the sequence. As a first step in leading to the construction of a more productive sequence, the number of words in which each of the nine consonants occurred with each of the six vowels was determined. This information would be useful in developing the most productive order of rule introduction, since no cumulative restrictions would be placed on the count of consonant vowel pairs. Therefore, the following list was constructed:

| | Total | I15 | A15 | E15 | U15 | O15 | EE10** |
|------|-------|-----|-----|-----|-----|-----|--------|
| *H10 | 25 | 6 | 4 | 6 | 7 | 2 | |
| S10 | 112 | 21 | 27 | 24 | 25 | 6 | 9 |
| N10 | 76 | 14 | 22 | 22 | 13 | 5 | |
| M10 | 64 | 14 | 14 | 10 | 21 | 5 | |
| R10 | 63 | 12 | 11 | 6 | 20 | 6 | 8 |
| L10 | 86 | 26 | 15 | 22 | 9 | 8 | 6 |
| T10 | 129 | 25 | 33 | 28 | 24 | 15 | 8 |
| D10 | 76 | 12 | 20 | 19 | 6 | 11 | 8 |
| P10 | 113 | 27 | 27 | 15 | 20 | 16 | 8 |
| B10 | 60 | 7 | 16 | 10 | 16 | 7 | 4 |
| | 359 | 71 | 80 | 64 | 67 | 40 | 27 |

Since the words covered by Block I rules have just one vowel apiece, each word contributed a tally in the appropriate vowel column for each different consonant it contained. For example, the word "smart" would contribute a tally in each of the following four cells of the A15 column: A-S, A-M, A-R, and A-T. Summing across a row gives the number of words in which that consonant occurs,

*The rule H10 was added to Block I, although it was not in the original Desberg and Cronnell sequence, because SH and TH rules are scheduled for Block II. It was felt the Block I should contain, S, T and H rules separately before their introductions as digraphs.

**It was later decided to move the EE10 rule into Block II, although it was included in Block I when this matrix was constructed.

since the words in this group had no more than one vowel. If a word repeated any consonants, only one tally, not two, was given to that particular consonant vowel combination. According to the "total" column of this matrix, the rank order of consonant rules, according to the frequency of their occurrence with all of the vowels in Block I, is: T10, P10, S10, L10, N10, D10, M10, R10, B10, H10. Similarly, the number of words in which each vowel rule occurred was counted. These figures are circled at the bottom of each column. (The circled numbers are not the sums of the columns. The sums would equal the number of times each vowel occurred with every other letter in each word of the lexicon.) The resulting rank order for the vowels was A15, I15, U15, E15, O15 and EE10. When individual cells in the matrix were rank ordered the result was: TA; TE; SA and PA; PI; LI and SU; SE; TI; SI, NA, NE and TU; LE, MU, RU and PU; DA and DE; BA; LA, BU and PO; TO; NI, MI, MA and PE; RI and NU; DI, RA and DO; BE.

Step 5. The most frequent consonants and vowels were then chosen from the consonant-vowel matrix. The rank order of the appearance of these consonants and vowels was also considered, since these two manners of ranking the consonants and vowel in terms of productivity might give different results, hence requiring certain adjustments.

The primary vowel rules A15, I15 and E15 were both the most productive and the highest in rank order of appearance. Therefore, a chart was made which showed for each vowel the number of Block I words which could be formed by that vowel combined with one, two, or three specified Block I

consonants.* (Five-letter combinations--i.e., 4 consonants-1 vowel--were not considered since they were relatively infrequent.)' Charts 1, 2 and 3 give the results of this procedure (See Appendix A). The number following some of the consonant combinations in Charts 1, 2 and 3 indicates the number of words possible using that combination with that chart's vowel.

Step 6. Three more charts were made, based on the data from the first three. These new charts first listed the two-consonant, one-vowel combinations which, according to the first chart for that vowel, were combinable into the largest number of words. These initial combinations were then combined with each of the other most productive consonant rules for that same vowel. Thus, three-consonant, one-vowel combinations were established for all of the most productive consonants for a given vowel. (See Charts 4, 5 and 6 in Appendix A).

Step 7. The words for the most productive two-consonant, one-vowel combinations were listed and compared. They were:

N10, T10, A15 - ant, tan, at, an
L10, T10, I15 - ill, it, lit, till
N10, P10, I15 - nip, in, inn, pin

It had been decided, on the basis of efficiency in maximizing productivity at this early stage, to include two vowels in the first unit. Thus, each of the above lists were expanded to include both A15 and I15, and the

*At this point, it should be noted, that, for various reasons -- the most common being low anticipated utility--the following words were deleted from those under consideration: sep hell hemp pent rend
smelt apt ass ban blab brad brat rat-tat tam tat lust num pun
rum rump sup trump dill din lisp pip primp spit. These deletions did not, however, affect the positions of A10, I10 and E10 as the most productive primary vowel rules.

following lists were compared:

N10, T10, A15, I15 - tin, tint, ant, tan, at, an, in, inn, it
L10, T10, A15, I15 - ill, at, it, till, lit
N10, P10, A15, I15 - an, in, inn, nap, pan, pin, nip

The combinations of N10, T10, A15 and I15, within this lexicon, proved to be the most productive and were therefore designated as Unit 1.

Step 8. For Unit 2, the most productive remaining consonant rules:

S10, P10, L10 and D10 were each considered in combination with Unit 1. The following word lists resulted:

S10 - sat, sin, sit, its
P10 - pan, nap, pat, tap, pant, pit, tip, pin, nip
L10 - lit, ill, till, lint
D10 - and, did

Thus, P10 was designated as Unit 2.

Step 9. For Unit 3, vowel Rule E15 and the remaining most productive consonant rules (L10, S10 and D10) were considered. The most productive pair was sought. This was, by far, L10 and S10. This pair, when combined with N10, T10, P10, A15 and I15, yielded 40 new words. D10 and E15 then became Unit 4.

Step 10. The remaining rules (M10, B10, H10, R10, O15 and U15) needed to be combined in a reasonable way for Units 5 and 6. The rules M10, B10, and U15 were designated Unit 5, the others as Unit 6. This resulted in a rather even split of the block's remaining words, with Unit 6 containing a few more than Unit 5. The final organization of rules and word exemplars for Block 1 is presented in Appendix B.

APPENDIX A

FREQUENCY COUNTS FOR BLOCK I RULES IN COMBINATION

Chart 1: Consonant - combination frequencies for 115 words in Block I

| | | | | | | | | | |
|--------|--------|--------|--------|-------|--------|--------|--------|--------|-------|
| T: 1 | S | P | L: 1 | N: 2 | B: 1 | D: 1 | M | H | R |
| TS: 1 | ST: 1 | PT: 2 | LT: 2 | NT | BT: 1 | DT | MT: 1 | HT: 1 | RT |
| TP | SP: 1 | PS | LS: 1 | NS | BS | DS | MS: 1 | HS | RS |
| TL | SL | PL | LP: 2 | NP: 2 | BP | DP: 1 | LP: 1 | HP: 1 | RP: 1 |
| TN: 2 | SN: 1 | PN | LN | NL | BL: 1 | DL | ML | HL: 1 | RL |
| TB | SB | PB | LB | NB | BN: 1 | DN | MN | HN | RN |
| TD | SD | PD | LD: 1 | ND | BD: 1 | DB | MB | HB | RB: 1 |
| TM | SM | PM | IM: 1 | NM | BM | DM: 1 | MD | HD: 1 | RD: 1 |
| TH | SH | PH | LH | NH | BH | DH | MH | HM: 1 | RM: 1 |
| TR | SR | PR | LR | NR | BR | DR | MR | HR | RH |
| TRL: 1 | SLD: 1 | PRM: 1 | IMP: 1 | | BLS: 1 | DRL: 1 | MST: 1 | HNT: 1 | |
| TRM: 1 | SIM: 1 | | LNT: 1 | | | | | | |
| TRP: 1 | SLP: 2 | | IST: 3 | | | | | | |
| | SNP: 2 | | | | | | | | |

Chart 2: Consonant - combination frequencies
for A15 words in Block I

| | | | | | | | | | |
|--------|--------|--------|--------|-------|--------|--------|--------|--------|-------|
| T: 1 | S | P | L | N: 1 | B | D: 2 | M: 1 | H | R |
| TS | ST: 1 | PT: 2 | LT | NT | BT: 2 | DT | MT: 1 | HT: 1 | RT: 1 |
| TP | SP | PS: 2 | LS: 1 | NS | BS: 1 | DS | MS: 1 | HS | RS |
| TL | SL | PL | LP: 2 | NP: 2 | BP | DP | MP: 1 | HP | RP: 1 |
| TN: 2 | SN | PN | LN | NL | BL | DL | ML | HL | RL |
| TB | SB | PB | LB | NB: | BN | DN | MN: 1 | HN | RN: 1 |
| TD | SD: 1 | PD: 1 | LD: 1 | ND: 1 | BD: 1 | DB: 1 | MB | HB | RB |
| TM | SM | PM | LM | NM | BM | DM: 2 | MD | HD: 1 | RD |
| TH | SH | PH | LH | NH | BH | DH | MH | HM: 1 | RM: 1 |
| TR | SR | PR | LR | NR | BR | DR | MR | HR | RH |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| TRP: 1 | SND: 1 | PNT: 1 | LMP: 1 | | BND: 1 | DMP: 1 | MST: 1 | HND: 1 | |
| | SLB: 1 | PST: 3 | LND: 1 | | BRN: 1 | | | | |
| | SIM: 1 | PLN: 1 | LST: 1 | | BRS: 1 | | | | |
| | SLP: 1 | | | | | | | | |
| | SNP: 2 | | | | | | | | |
| | STB: 1 | | | | | | | | |

Chart 3: Consonant - combination frequencies
for E15 words in Block I

| T | S | P: 1 | L | N | B | B | M | H | R |
|----|--------|--------|--------|-------|--------|--------|--------|--------|--------|
| TS | ST: 2 | PT: 1 | LT: 2 | NT: 3 | BT: 1 | DT | MT: 1 | HT | RT |
| TP | SP | PS | LS: 1 | NS | ES | DS | MS: 1 | HS | RS |
| TL | SL | PL | LP | NP | BP | DP | MP | HP | BP |
| TN | SN | NP: 1 | LN | NL | BL: 1 | DL: 2 | ML | HL | RL |
| TB | SB | PB | LB | NB | BN | DN: 1 | MN: 1 | HN: 1 | RN |
| TD | SD | PD | LD | ND: 1 | BD: 1 | DB | MB | HB | RB |
| TM | SM | PM | LM: 1 | NM | EM | DM | MD | HD | RD: 1 |
| TH | SH | PH | LH | NH | BH | DH | MH | HM: 1 | RM |
| TR | SR | PR | LR | NR | BR | DR | MR | HR | RH |
| | | | | | | | | | |
| | SND: 1 | PLT: 1 | LND: 1 | | BLT: 1 | DNT: 2 | MLT: 1 | HLD: 1 | RNT: 1 |
| | SNT: 2 | PST: 1 | | | BND: 1 | DRS: 1 | MND: 1 | HLF: 1 | RST: 1 |
| | SLD: 1 | PRS: 1 | | | BNT: 1 | | | | |
| | SML: 1 | | | | BST: 1 | | | | |
| | SPD: 1 | | | | BLD: 1 | | | | |
| | SPL: 1 | | | | BLS: 1 | | | | |
| | STM: 1 | | | | | | | | |

Chart 4: Most frequent two- and three-
letter combinations for 115
words in Block I

| CONSONANT COMBINATION | NUMBER OF WORDS OBTAINABLE | CONSONANT- RULE ADDED | TOTAL NUMBER OF WORDS OBTAINABLE |
|--------------------------|-------------------------------|--------------------------|--|
| PT | 3 | S | 6 |
| | | L | 8 |
| LT | 4 | P | 8 |
| | | S | 10 |
| TN | 5 | P | 9 |
| | | S | 8 |
| | | L | 9 |
| LP | 3 | S | 7 |
| | | T | 8 |
| NP | 4 | T | 9 |
| | | S | 8 |
| | | L | 7 |

Chart 5: Most frequent two- and three-
letter combinations for A15
words in Block I

| CONSONANT COMBINATION | NUMBER OF WORDS OBTAINABLE | CONSONANT- RULE ADDED | TOTAL NUMBER OF WORDS OBTAINABLE |
|--------------------------|-------------------------------|--------------------------|--|
| PS | 2 | N | 7 |
| | | T | 9 |
| | | L | 6 |
| | | M | 5 |
| | | D | 6 |
| PT | 3 | N | 9 |
| | | S | 9 |
| | | L | 5 |
| | | M | 6 |
| | | D | 6 |
| PL | 2 | N | 6 |
| | | S | 6 |
| | | T | 5 |
| | | M | 5 |
| | | D | 6 |
| PN | 3 | S | 7 |
| | | T | 9 |
| | | M | 6 |
| | | L | 6 |
| | | D | 7 |

Chart 5: For A15 - Continued

| INITIAL COMBINATION | NUMBER OF WORDS OBTAINABLE | CONSONANT RULE ADDED | TOTAL NUMBER OF WORDS OBTAINABLE |
|---------------------|----------------------------|----------------------|----------------------------------|
| NT | 4 | S | 5 |
| | | L | 4 |
| | | M | 7 |
| | | D | 7 |
| | | P | 9 |
| <hr/> | | | |
| DM | 5 | N | 8 |
| | | T | 7 |
| | | L | 6 |
| | | P | 8 |
| | | S | 7 |

Chart 6: Most frequent two- and three-
letter combination for 115 words
in Block I

| INITIAL COMBINATION | NUMBER OF WORDS OBTAINABLE | CONSONANT- RULE ADDED | TOTAL NUMBER OF WORDS OBTAINABLE |
|------------------------|-------------------------------|--------------------------|--|
| TS | 2 | L | 5 |
| | | N | 6 |
| | | D | 2 |
| <hr/> | | | |
| LT | 2 | S | 5 |
| | | N | 5 |
| | | D | 4 |
| <hr/> | | | |
| NT | 3 | S | 7 |
| | | L | 5 |
| | | D | 7 |
| <hr/> | | | |
| DL | 2 | S | 4 |
| | | T | 4 |
| | | N | 5 |



SOUTHWEST REGIONAL LABORATORY
TECHNICAL NOTE

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NO TN 5-70-20

TITLE: WORDLIST

AUTHOR: Richard Angilly and Lanaii Kline

ABSTRACT

WORDLIST sequences a lexicon of words (coded for spelling-to-sound correspondences) in such a way that, with the introduction of each correspondence rule, the words listed by the program contain that rule in combination with previously introduced rules.

WORDLIST

1.0 - PROGRAM IDENTIFICATION

WORDLIST

2.0 - OBJECTIVE

The purpose of the computer program for the 1970 Reading Program was to sequence the lexicon of 6000 words (coded for spelling-to-sound correspondences) in such a way that, with the introduction of each correspondence rule, the words listed by the program would contain that rule in combination with previously introduced rules. In addition, the program provided the following supplemental information:

1. a count of the number of words listed upon the introduction of each rule;
2. a count of the number of words listed for each unit of rules;
3. a count of the number of words listed for each block of units of rules;
4. an alphabetical listing of the non-coded (polysyllabic) words.

This program was run separately for the portion of the lexicon designated as appropriate for the 6-7 age group and again for the lexicon for the 8-9 age group.

An adjunct to the program classified the irregular words in the same manner as the regular words except that the irregular rule(s) within the words were designated as equivalent, for sequencing purposes, to their earliest-appearing regular counterparts (e.g., A40 = A15).

3.0 - PROGRAM DESCRIPTION

3.1 - Program Logic

The program is set up in two parts. The first goes through a list of words from file, ICARD, and checks for the rules associated with that word. If there are no rules, the program stores the word in file, NRLST; otherwise, the program finds the highest rule associated with that word by comparing the rules to the hierarchy of the rules in file, IRULST. The program then determines if the high rule is a forty-rule. If so, the word is stored in file, TABLE, with a flag equal to one; otherwise, the flag is equal to zero. TABLE and NRLST are alphabetically sorted since IRULST is alphabetized. The

second phase of execution determines the words with forty-rules and bypasses them. The remaining words (regular rules) are sorted by rule, and each rule is then sequenced according to the number of words which use that rule. Based on that number, space is created on a random access file. The file is then printed on a PRINT file. The forty-rules are also sequenced according to the number of words using that rule. Space is allocated on a random access file; then the file is printed on PRINT followed by the words in file, NRLST.

3.2 - Variables

- IREG(268) - frequency counter for that rule-name for rule based words.
- IFOR(268) - frequency counter for that rule-name for forty-words.
- IBLK(268) - block number (from 01 to 22).
- IUNT(268) - unit number (associated with the block number).
- ISYLA(268) - syllable duplication indicator
(' ' - only occurrence of rule-name)
(0 - first occurrence of rule-name; associated with one syllable words)
(1 - second occurrence of rule-name; associated with word having emphasis on its first syllable)
(2 - third (last) occurrence of rule-name; associated with word having emphasis on its second syllable)
- IRULSTZ(268) - individual rule-name (arranged hierarchially: 1 to 220) (two special rule-names:
'E7980' - if 'E' indicator present in col. 79 or 80 of input)
'FORTY' - for words having only '40' rule-names)
- IWORD - the word up to and including 16 characters.
- IRULES - rule-names associated with the word (3, 4, or 5 characters in length; separated by a comma)
- ISYLL - syllable notation
' ' - no rule words
0 - one-syllable words
1, 3, 4 - more than one syllable having stress on first syllable.
2 - more than one syllable having stress on second syllable.
- 179E and 180E - special indicators (' ' and E)
(E implies highest rule-name associated with that word would be rule-name 'E7980' concerning words having special 'E' endings)
- HIRULE - highest rule-name associated with that word
- HI - hierarchial number associated with that rule name
(1 to 220)
- LONG - indicator: IZERO = 0 = rule-based words
IZERO LONG = 1 = forty-words

4.0 - SUBROUTINES AND FUNCTIONS

REPOSITION - repositions records on disk. An ITS library routine.

5.0 - DATA SPECIFICATIONS

5.1 - Input Formats

| File: | | variable | format |
|-------|-----------|----------------|--------|
| | Col 1 | INK(268) | A1 |
| | Col 2-6 | IRULSTZ(5,268) | 5A1 |
| | Col 7 | ISYLA(268) | A1 |
| | Col 8-9 | IBLK(268) | 12 |
| | Col 10 | IUNT(268) | I1 |
| | Col 11-13 | IREG(268) | 13 |
| | Col 14-16 | IFOR(268) | 13 |
| File: | ICARD | | |
| | Col 3-18 | IWORD(4) | 4A4 |
| | Col 19-68 | IRULES(50) | 50A1 |
| | Col 69 | ISYLL | I1 |
| | Col 79-80 | 179E and 180E | 2A1 |

5.2 - Output Formats

| File: | | variable | format |
|-------|-----------|----------------|--------|
| | Col 1 | LONE or IZERO | I1 |
| | Col 2-17 | IWORD(4) | 4A4 |
| | Col 18-22 | HIRULE(5) | 5A1 |
| | Col 23-25 | HI | 13 |
| File: | IRULST | | |
| | Col 1-16 | IWORD(4) | 4A4 |
| File: | RULST | | |
| | Col 1-5 | IRULSTZ(5,268) | 5A1 |
| | Col 6 | ISYLA(268) | A1 |
| | Col 7-8 | IBLK(268) | 12 |
| | Col 9 | IUNT(268) | I1 |
| | Col 10-12 | IREG(268) | 13 |
| | Col 13-15 | IFOR(268) | 13 |
| File: | IRDLST | | |
| | Col 1-4 | L or NUM | 14 |
| | Col 5-20 | WORD(4) | 4A4 |
| | Col 21-25 | HIRULE(5) | 5A1 |
| | Col 26-28 | HI | 13 |

6.0 - PROGRAM CONSTRAINTS AND LIMITATIONS

6.1 - Language

FORTRAN II

6.2 - Vendor

International Time Sharing Corporation

6.3 - Storage Requirements
Random Access Disk

6.4 - Hardware Configuration
CDC 3300

6.5 - Program Parameters
The current maximum array size is 268. This number corresponds to the total number of rules. To expand the rules the user must be sure to change the dimensions of those affected variables and to change those do-loops which fall under the influence of the number of rules used.

6.6 - Error Messages
The program prints out a list of errors in the rules, but will continue execution.

The program also types messages relating to the point in execution at which the program is currently located.

6.7 - Additional Information
An update program, CORRECT, works in conjunction with WORDLIST. See the documentation for CORRECT for further details.

7.0 - OPERATING INSTRUCTIONS

The program execution mode is via interactive operation through operator interaction at a console. The following is printed on the console as feed-back relating to the execution of the program.

```
"START OF EXECUTION"  
"SECOND PASS BEGUN"  
"WRDLST OPEN"  
"WRDLST1 OPEN"  
"NRLST OPEN"  
"PROGRAM COMPLETED"
```

See Attachment 1 for sample data and Attachment 2 for sample run.

All output files (NRLST and TABLE) must be deleted manually. In order to get a printed output from the file, PRINT, the user must inform the operator to print the file and give him mailing instructions.

8.0 - FLOWCHART

Available upon request.

```
PROGRAM WORDLIST
C  CREATES A WORDLIST (CORRESPONDING TO THE HIGHEST RULE-NAME)
C  FOR RULE-BASED-WORDS AND FORTY-WORDS.
  INTEGER HIRULE,HI
  DIMENSION INK(268),IRULSTZ(5,268)      A(268),IBLK(268),IUNT(268),
  IIREG(268),IFOR(268),IPOINT(268),    K(4),IRULES(50),IRULE(5),
  2HIRULE(5)
  LONE=1
  IZER0=0
  NRT0T=0000
  TYPE,"START OF EXECUTION"
  OPEN(2),INPUT,IRULST
  DO 10 I=1,268
  READ(2,1),INK(I),(IRULSTZ(N,I),N=1,5),ISYLA(I),IBLK(I),IUNT(I),
  IIREG(I),IFOR(I)
1  FORMAT(A1,5A1,A1,I2,I1,2I3)
10  CONTINUE
  TYPE,"IRULST INPUT"
  CLOSE(2)
  OPEN(2),INPUT,ICARD
  OPEN(3),OUTPUT,TABLE
  OPEN(4),OUTPUT,NRLST
  WRITE(1,6)
  6  FORMAT(25X,"ERROR LIST",/)
  2  READ(2,4),(IWORD(N),N=1,4),(IRULES(M),M=1,50),ISYLL,I79E,I80E
  4  FORMAT(2X,4A4,50A1,I1,9X,2A1)
  IF END RECORD 2,500
  J=1
  K=1
  IEND=0
  IFORTY=0
  DO 5 M=1,5
  IRULE(M)=" "
  HIRULE(M)=" "
  5  CONTINUE
  HI=000
  8  IF(IRULES(J)-" ")15,20,15
  20 IF(IRULES(J+1)-" ")18,21,18
  21 IF(HI)80,22,80
  22 IF(J-4)24,80,80
  24 WRITE(4,16),(IWORD(N),N=1,4)
  16 FORMAT(4A4)
  NRT0T=NRT0T+1
  GO TO 2
  15 IF(IRULES(J)-",")18,23,18
  23 J=J+1
  19 DO 29 K=1,5
  IF(IRULE(K)-"4")29,33,29
  33 IF(IRULE(K+1)-"0")70,30,70
  30 IFORTY=1
  K=1
  GO TO 70
```

```
29 CONTINUE
   GO TO 70
18 IRULE(K)=IRULES(J)
   K=K+1
   J=J+1
   GO TO 8
70 DO 71 I=1,268
   DO 50 M=1,5
   IF(IRULE(M)-IRULSTZ(M,I))71,50,71
50 CONTINUE
73 IF(ISYLA(I)-" ")74,75,74
75 IF(HI)76,77,76
76 IF(HI-1)77,77,78
77 DO 56 M=1,5
   HIRULE(M)=IRULE(M)
56 CONTINUE
   HI=I
78 K=1
   DO 57 M=1,5
   IRULE(M)=" "
57 CONTINUE
   IF(IEND-1)8,79,8
79 IEND=0
   GO TO 80
74 IF(ISYLL)105,100,105
105 GO TO (101,102,101,101),ISYLL
100 IF(ISYLA(I)-"0")71,75,71
101 IF(ISYLA(I)-"1")63,75,63
63 IF(ISYLA(I)-"3")64,75,64
64 IF(ISYLA(I)-"4")71,75,71
102 IF(ISYLA(I)-"2")71,75,71
71 CONTINUE
   GO TO 110
80 DO 58 M=1,5
   IF(IRULE(M)-" ")81,58,81
58 CONTINUE
82 IF(I79E-"E")83,84,83
84 DO 59 M=1,5
   HIRULE(M)=IRULSTZ(M,236)
59 CONTINUE
   HI=236
   GO TO 90
83 IF(I80E-"E")90,84,90
81 IEND=1
   GO TO 19
90 IF(IFORTY-1)91,93,110
93 WRITE(3,94),LONE,(IWORD(N),N=1,4),(HIRULE(M),M=1,5),HI
94 FORMAT(I1,4A4,5A1,I3)
   I=HI
   IFOR(I)=IFOR(I)+1
   ifORTY=0
   GO TO 2
```

```
91 WRITE(3,95), IZERO, (IWORD(N), N=1, 4), (HIRULE(M), M=1, 5), HI
95 FORMAT(I1, 4A4, 5A1, I3)
   I=HI
   IREC(I)=IREG(I)+1
   GO TO 2
110 WRITE(1,115), (IWORD(N), N=1, 4), (IRULES(M), M=1, 50), ISYLL,
   II 79E, I80E
115 FORMAT(/, 4A4, 50A1, I1, 2A1)
   WRITE(1,117), (IRULE(M), M=1, 5)
117 FORMAT(8X, "*****ERROR IN RULE ", 5A1, /)
   GO TO 2
500 CLOSE(2)
   OPEN(2), OUTPUT, RULST
   DO 300 I=1, 268
   WRITE(2,310), (IRULSTZ(N,I), N=1, 5), ISYLA(I), IBLK(I), IUNT(I),
   IIREG(I), IFOR(I)
310 FORMAT(5A1, A1, I2, I1, 2I3)
300 CONTINUE
   CLOSE(2)
   OPEN(2), OUTPUT, PRINT
   TYPE, "SECOND PASS BEGUN"
   ISET=0
   CLOSE(4)
   OPEN(4), OUTPUT, WRDLST
505 CLOSE(3)
   OPEN(3), INPUT, TABLE
   IUNIT=0000
   IRLCK=0000
   ITOTAL=0000
   ICNT=0000
   IP0INT(1)=0001
   DO 510 I=2, 269
   IP0INT(I)=IP0INT(I-1)+IREG(I-1)
510 CONTINUE
   LAST=IP0INT(269)-1
   DO 515 L=1, LAST
   WRITE(4, 516), L
516 FORMAT(I4)
   INSERT(4)
515 CONTINUE
520 READ(3, 501), KEY, (IWORD(N), N=1, 4), (HIRULE(M), M=1, 5), HI
501 FORMAT(I1, 4A4, 5A1, I3)
   IF END RECORD 3, 525
   IF(ISET-0) 508, 507, 508
507 IF(KEY-0) 520, 503, 520
508 IF(KEY-1) 520, 503, 520
503 J=HI
   SKIP(4), BEGINFILE
   SKIP(4), FORWARD, IP0INT(J)-1, RECORDS
   CALL REPOSITION(4)
   IP0INT(J)=IP0INT(J)+1
   WRITE(4, 506), (IWORD(N), N=1, 4), (HIRULE(M), M=1, 5), HI
```

```
506  FORMAT(4A4,5A1,I3)
      GO TO 520
525  WRITE(2,502)
502  FORMAT(7////,33X,"*****")
      IF(ISET=0)520,521,522
521  WRITE(2,526)
526  FORMAT(33X,"* RULE-BASED-WORDS *")
      TYPE,"WRDLST OPEN"
      GO TO 528
522  WRITE(2,523)
523  FORMAT(33X,"*   FORTY-WORDS   *")
528  WRITE(2,504)
504  FORMAT(33X,"*****",///// )
      WRITE(2,561)
561  FORMAT("*****BLOCK 1 *****",//)
      CLOSE(4)
      IF(ISET)511,512,511
512  OPEN(4),INPUT,WRDLST
      GO TO 529
511  OPEN(4),INPUT,WRDLST1
529  I=1
      LINE=0
      IFIN=0
514  READ(4,530),NUM
530  FORMAT(I4)
      READ(4,532),(IWORD(N),N=1,4),(HIRULE(M),M=1,5),HI
532  FORMAT(4A4,5A1,I3)
      SKIP(4),FORWARD,1,RECORDS
      IF END FILE 4,536
      IF(LINE)517,513,517
513  IF(ISET)509,518,509
518  IF(INK(I)-"1")509,517,509
509  WRITE(2,527),(IRULSTZ(N,I),N=1,5),IREG(I)
527  FORMAT(5A1,5X,"FREQUENCY=",I3,/)
      IUNIT=IUNIT+IREG(I)
      IBLCK=IBLCK+IREG(I)
      ITOTAL=ITOTAL+IREG(I)
517  DO 535 M=1,5
      IF(HI-I)531,535,531
535  CONTINUE
      WRITE(2,540),(IWORD(N),N=1,4)
540  FORMAT(7X,4A4,/)
      LINE=1
      GO TO 514
536  IFIN=1
531  IF(IUNT(I)-IUNT(I+1))537,550,537
537  WRITE(2,541),IBLK(I),IUNT(I),IUNIT
541  FORMAT(10X,"BLOCK ",I2,"   UNIT ",I1,5X,"FREQUENCY=",I4,/)
      IF(IBLK(I)-IBLK(I+1))538,539,538
539  IUNIT=0000
      GO TO 550
```

```
538 WRITE(2,542),IBLK(I),IBLOCK
542 FORMAT(10X,"TOTAL BLOCK ",I2,5X,"FREQUENCY=",I4,/)
315 IUNIT=0000
    IBLOCK=0000
    IF(IFIN)552,565,552
565 WRITE(2,566),IBLK(I+1)
566 FORMAT("*****BLOCK ",I2," *****",/)
550 I=I+1
    LINE=0
    GO TO 513
552 IF(IBLK(I)-23)565,575,575
575 WRITE(2,543),ITOTAL
543 FORMAT(///,25X,"#####TOTAL WORDS=",I4," #####",/////
    IP(ISET-1)551,555,555
551 ISET=1
    DO 560 I=1,268
    IREG(I)=IFOR(I)
560 CONTINUE
    TYPE,"WRDLST1 OPEN"
    CLOSE(4)
    OPEN(4),OUTPUT,WRDLST1
    GO TO 505
555 CLOSE(4)
    OPEN(4),INPUT,NRLST
    TYPE,"NRLST OPEN"
    WRITE(2,572)
572 FORMAT(////,33X,"*****")
    WRITE(2,558)
558 FORMAT(33X,"* WORDS WITH NO RULES *")
    WRITE(2,573)
573 FORMAT(33X,"*****",/////
557 READ(4,568),(IWORD(M),M=1,4)
568 FORMAT(4A4)
    IF END RECORD 4,581
    WRITE(2,569),(IWORD(M),M=1,4)
569 FORMAT(10X,4A4,/)
    DO 574 M=1,16
    IWORD(M)=" "
574 CONTINUE
    GO TO 557
581 WRITE(2,571),NRTOT
571 FORMAT(25X,"#####TOTAL WORDS=",I4," #####",/////
    TYPE,"PROGRAM COMPLETED"
    END
```

Attachment 1

IRULST
Database
(Sample Data)

| | | | | | | | |
|------|------|------|------|-------|------|-------|-----|
| N10 | 011 | E11 | 0062 | U16 | 2104 | S31 | 153 |
| NN10 | 011 | C11 | 070 | A16 | 2104 | E19 | 153 |
| T10 | 011 | G11 | 070 | Ø16 | 2104 | S20 | 154 |
| TT10 | 011 | A15 | 1081 | E16 | 2104 | S21 | 154 |
| A15 | 0011 | E15 | 1081 | E21 | 2104 | A22 | 155 |
| I15 | 0011 | I15 | 1081 | I21 | 2104 | UE10 | 161 |
| P10 | 012 | Ø15 | 1081 | Ø21 | 2104 | IE11 | 161 |
| PP10 | 012 | U15 | 1081 | A21 | 2104 | ØE10 | 161 |
| L10 | 013 | A11 | 1081 | A25 | 2104 | AI10 | 162 |
| LL10 | 013 | E11 | 1081 | Ø22 | 2104 | ØU10 | 163 |
| S10 | 013 | I11 | 1081 | EE10 | 2104 | ØA10 | 164 |
| SS10 | 013 | Ø11 | 1081 | Y19 | 2104 | AW10 | 165 |
| D10 | 014 | U11 | 1081 | A17 | 2105 | AU10 | 165 |
| DD10 | 014 | EE10 | 1081 | E17 | 2105 | ØI10 | 166 |
| E15 | 0014 | Y19 | 1081 | Ø17 | 2105 | ØY10 | 166 |
| M10 | 015 | A16 | 1082 | U17 | 2105 | EW10 | 167 |
| MM10 | 015 | I16 | 1082 | I17 | 2105 | UI10 | 167 |
| B10 | 015 | U16 | 1082 | A16 | 0140 | GH10 | 171 |
| BB10 | 015 | E16 | 1082 | E16 | 0140 | I24 | 171 |
| U15 | 0015 | Ø16 | 1082 | I16 | 0140 | K20 | 172 |
| R10 | 016 | A21 | 0091 | Ø16 | 0140 | W20 | 172 |
| RR10 | 016 | Ø21 | 0091 | U16 | 0140 | B20 | 173 |
| H10 | 016 | I21 | 0091 | NG10 | 1111 | H20 | 173 |
| Ø15 | 0016 | E21 | 0091 | NG10 | 2111 | L20 | 174 |
| SH10 | 021 | E21 | 1092 | CH10 | 112 | T20 | 174 |
| TH13 | 021 | I21 | 1092 | TCH10 | 112 | U20 | 175 |
| TH11 | 022 | A21 | 1092 | WH10 | 113 | PH10 | 181 |
| FE10 | 0031 | Ø21 | 1092 | QU10 | 114 | C131 | 181 |
| E25 | 031 | A25 | 0093 | GG10 | 115 | TH12 | 182 |
| Y19 | 0032 | Ø22 | 0093 | CC12 | 115 | F7980 | 200 |
| F10 | 041 | A25 | 1093 | G31 | 116 | A12 | 211 |
| FF10 | 041 | Ø22 | 1093 | AY10 | 121 | I12 | 211 |
| W10 | 041 | I17 | 1101 | EA11 | 122 | Ø12 | 211 |
| K10 | 042 | U17 | 1101 | EA31 | 122 | U12 | 211 |
| N20 | 042 | E17 | 1101 | ØØ11 | 123 | E14 | 211 |
| C12 | 042 | A17 | 1101 | ØØ12 | 123 | I14 | 211 |
| CK10 | 042 | Ø17 | 1101 | ØW11 | 124 | A14 | 212 |
| G12 | 043 | Y17 | 102 | ØW12 | 124 | Ø14 | 212 |
| J10 | 044 | LE22 | 102 | Ø31 | 131 | U14 | 212 |
| X10 | 044 | A11 | 2104 | U31 | 131 | Y11 | 213 |
| Y10 | 044 | E11 | 2104 | A23 | 132 | Y15 | 213 |
| V10 | 045 | I11 | 2104 | Ø23 | 132 | A29 | 221 |
| Z10 | 045 | Ø11 | 2104 | I22 | 133 | A24 | 221 |
| ZZ10 | 045 | U11 | 2104 | Ø24 | 133 | I25 | 222 |
| NG10 | 0050 | A15 | 2104 | E13 | 151 | I26 | 231 |

Attachment 2
Wordlist
(Sample Output)

* RULE-BASED -WORDS *

*****BLOCK 1*****

N10 FREQUENCY= 0

NN10 FREQUENCY= 0

T10 FREQUENCY= 0

TT10 FREQUENCY= 0

A15 FREQUENCY= 1

ANT

I15 FREQUENCY= 0

BLOCK 1 UNIT 1 FREQUENCY= 1

P10 FREQUENCY= 0

PP10 FREQUENCY= 0

BLOCK 1 UNIT 1 FREQUENCY= 0

L10 FREQUENCY= 0

LL10 FREQUENCY= 0

S10 FREQUENCY= 0

SS10 FREQUENCY= 0

BLOCK 1 UNIT 3 FREQUENCY= 0

D10 FREQUENCY= 0
DD10 FREQUENCY= 0
E15 FREQUENCY= 0
 BLOCK 1 UNIT 4 FREQUENCY = 0

M10 FREQUENCY= 0
MM10 FREQUENCY= 0
B10 FREQUENCY= 0
BB10 FREQUENCY= 0
U15 FREQUENCY= 0
 BLOCK 1 UNIT 5 FREQUENCY = 0

R10 FREQUENCY= 0
RR10 FREQUENCY= 0
H10 FREQUENCY= 0
Ø15 FREQUENCY= 0
 BLOCK 1 UNIT 6 FREQUENCY= 0

TOTAL BLOCK 1 FREQUENCY= 1

#####TOTAL WORDS= 14#####

* FORTY-WORDS *

*****BLOCK 1*****

N10 FREQUENCY= 0

NN10 FREQUENCY= 0

N40 FREQUENCY= 0

T10 FREQUENCY= 0

TT10 FREQUENCY= 0

T40 FREQUENCY= 0

A15 FREQUENCY= 0

A40 FREQUENCY= 0

I15 FREQUENCY= 0

I40 FREQUENCY= 0

BLOCK 1 UNIT 1 FREQUENCY= 0

P10 FREQUENCY= 0

PP10 FREQUENCY= 0

P40 FREQUENCY= 0

BLOCK 1 UNIT 2 FREQUENCY= 0

I.10 FREQUENCY= 0
LL10 FREQUENCY= 0
L40 FREQUENCY= 0
S10 FREQUENCY= 0
SS10 FREQUENCY= 0
S40 FREQUENCY= 0
SS40 FREQUENCY= 0

 BLOCK 1 UNIT 3 FREQUENCY= 0

D10 FREQUENCY= 0
DD10 FREQUENCY= 0
D40 FREQUENCY= 0
E15 FREQUENCY= 0
E40 FREQUENCY= 0

 BLOCK 1 UNIT 4 FREQUENCY= 0

M10 FREQUENCY= 0
MM10 FREQUENCY= 0
B10 FREQUENCY= 0
BB10 FREQUENCY= 0
B40 FREQUENCY= 0
U15 FREQUENCY= 0
U40 FREQUENCY= 0

 BLOCK 1 UNIT 5 FREQUENCY= 0

R10 FREQUENCY= 0

RR10 FREQUENCY= 0

R40 FREQUENCY= 0

H10 FREQUENCY= 0

H40 FREQUENCY= 0

Ø15 FREQUENCY= 0

Ø40 FREQUENCY= 0

BLOCK 1 UN11 6 FREQUENCY= 0

TOTAL BLOCK 1 FREQUENCY= 0

*****BLOCK 2*****

#####TOTAL WORDS= 4#####

* WORDS WITH NO RULES *

CONSTITUTION

SHOVEL

#####TOTAL WORDS= 2#####



SOUTHWEST REGIONAL LABORATORY
TECHNICAL NOTE

DATE August 27, 1970

NO TN 5-70-21

TITLE: CORRECT

AUTHOR: Richard Angilly and Lanaii Kline

ABSTRACT

CORRECT is a file maintenance program designed specifically to update input files for the program WORDLIST.

CORRECT

1.0 - PROGRAM IDENTIFICATION

CORRECT

2.0 - OBJECTIVE

The program was written to make corrections to individual records of the input file, ICARD, for the program WORDLIST.

3.0 - PROGRAM DESCRIPTION

3.1 - Program Logic

The program reads one hundred records at a time from input file, ICARD. From the terminal the user enters a number which points to the particular record to be changed (numbers range from 1 to 100). The system writes the record out on the console and waits for acknowledgment stating that the record is the one to be changed. If it is not, then the user enters another record number, and the process continues. Once the record is found, it is replaced by a record entered via the console. To change other records the process is repeated by stating a new record number for the input and by inputting successive groups of one hundred. A "z" is added in column 80 to assure that all records are 80 characters (card images) in length.

3.2 - Variables

- IWORD(80,100) - input card images from the file, ICARD.
- NAME - a card number from 1 to 100 representing the card to be updated. This variable is entered via the console.

4.0 - SUBROUTINES AND FUNCTIONS

None

5.0 - DATA SPECIFICATIONS

5.1 - Input Formats

| File | ICARD | Variable | Format |
|------|----------|----------|--------|
| | Col 1-80 | IWORD | 80A1 |

File: console input
Free form formatting.

5.2 - Output Formats

File: NEW
Col 1-80

Variable . Format
IWORD 80A1

6.0 - PROGRAM CONSTRAINTS AND LIMITATIONS

6.1 - Language

FORTRAN (Special commands used in the program limits the program to the ITS system)

6.2 - Vendor

International Time Sharing Corporation

6.3 - Storage Requirements

Random Access Disk

6.4 - Hardware Configuration

CDC*3300

6.5 - Program Parameters

The maximum number of records that can be processed at a time is one hundred. For files that have more than one hundred records, the program will read successive groups of one hundred until it finds an end-of-file. The output file name, NEW, must be changed after the program is executed so that it may become input for the WORDLIST program. The new name must be ICARD.

6.6 - Error Messages

None

7.0 - OPERATING INSTRUCTIONS

7.1 - The program is executed via interactive operation through operator intervention at a console.

7.2 - Operator Actions and Program Control Information

s = system response

u = user response

s: "WHICH LINE?"

u: user enters a number from 1 to 100 indicating that record to be changed. This number is read as variable, NAME.

s: The system writes the record indicated to the console.

s: "OK?"

u: Y this is the record to be modified.

N this is not the record to be modified.

If Y, then

s: "NOW GO"

u: enter the corrected record.
*s: "ANOTHER"
u: Y if there are more lines to be modified.
N if there are no more lines in the group of one hundred records to be modified.

If Y, then
s: "WHICH LINE?"
u: user enters a line number, and the process continues.

If N, then
s: "ANY MORE LINES?"
u: Y or N

If Y, then
s: "WHICH LINE?", and the process continues.

If N, then
s: The system processes the one hundred records and writes them on file, NEW. The program then reads another group of one hundred, and the process continues.

If N, then
s: "ANOTHER"
u: Y or N and the user continues as above (*).

7.3 - Sample data see Attachment 1.

7.4 - Sample run
See section 7.2 for example of sample run. The program updates the data base, ICARD, and writes the updated version on a tape.

8.0 - PROGRAM FLOWCHART

Not available.

```
PROGRAM CORRECT
DIMENSION IWORD(80,100)
OPEN(2),INPUT,ICARD
OPEN(3),OUTPUT,NEW
IT=0000
IEND=0
15  TYPE,"WHICH LINE?"
    ACCEPT,NAME
5   DO 100 I=1,100
    READ(2,10),(IWORD(N,I),N=1,80)
10  FORMAT(80A1)
    IF END RECORD 2,250
:00  CONTINUE
    IT=IT+100
60  IF(IT-NAME)50,150,150
50  IF(IEND-1)70,55,70
55  DO 130 J=1,(I-1)
    IF(IWORD(80,J)-"E")56,57,56
56  IWORD(80,J)="Z"
57  WRITE(3,10),(IWORD(N,J),N=1,80)
130  CONTINUE
    GO TO 300
70  WRITE(1,25),IT
25  FORMAT(10X,I4)
    DO 125 I=1,100
    IF(IWORD(80,I)-"E")120,110,120
120  IWORD(80,I)="Z"
110  WRITE(3,10),(IWORD(N,I),N=1,80)
:25  CONTINUE
    GO TO 5
150  IF(IEND-1)160,170,170
170  J=NAME-(IT-I)
    GO TO 180
160  J=NAME-(IT-100)
180  WRITE(1,10),(IWORD(N,J),N=1,80)
    TYPE,"OK?"
    ACCEPT 99,NOW
99   FORMAT(A1)
    IF(NOW-"Y")75,200,75
200  TYPE,"  NOW GO"
    READ(0,10),(IWORD(N,J),N=1,80)
75   TYPE,"ANOTHER"
    ACCEPT 199,L0W
199  FORMAT(A1)
    IF(L0W-"Y")220,230,220
230  TYPE,"WHICH LINE?"
    ACCEPT,NAME
    GO TO 60
220  TYPE,"ANY MORE LINES ?"
    ACCEPT 299,M0W
299  FORMAT(A1)
    IF(M0W-"Y")225,230,225
225  NAME=6000
    GO TO 60
250  IT=IT+I
    WRITE(1,240),IT
240  FORMAT(10X,"END="I4,/)
    IEND=1
    GO TO 60
300  END
```

Attachment 1

ICARD
database

| | | |
|---------------------|--|-----|
| 6 ABSENCE N | A16, B10, S10, E17, N10, C11, E18 | 1 |
| 6 ABUSE N | A17, B10, U11, S40, E18 | 2 |
| 6 ABUSE V | A17, B10, U11, S20, E18 | 2 |
| 6 ACHE N, V | A40, CH31, E18 | 0 |
| 6 ACTION N E | A16, C12 | 1 |
| 6 CONSTITUTION N | | |
| 6 ANGLE N | A16, N20, G12, LE22 3 | 3 2 |
| 6 ANT N | A15 | 0 |
| 6 BOW N, V | B40, OW40 | 0 |
| 6 CUTE AJ P | C12, U11, T10, E18 | 3 |
| 6 EARRING N | EA11, RR10, I15, NG10 4 | 1 3 |
| 6 EDGE N, V | E13, D10, G19, E18 | 0 |
| 6 GET V E | G31, E15, T40 | 0 |
| 6 GUARD N, V | G12, U20, A21, R10, D10 | 4 |
| 6 HOUSE N | H10, OU10, S21, E18 | 0 |
| 6 INVITE V | I16, N10, V10, I11, T10, E18 | 2 |
| 6 RING N, V | R10, I15, NG10 | 0 |
| 6 ROB V | R-0, Ø15, B10 | 1 |
| 6 SEPARATE AJ P | S10, E40, P10, A32, R10, A17, T10, E18 | 0 |
| 6 SHE PN | SH10, E25 | 3 |
| 6 SHOVEL N, V | | |
| 6 STRANGE AJ | S10, T10, R10, A40, N10, G11, E18 | 0 |
| 6 UNDER AV, PP | U16, N10, D10, E21, R10 | 1 |
| 6 YOLK N | Y10, Ø23, I 20, K10, | 0 |

| | | | |
|-----------------|---|---|-----|
| 6 ABSENCE | A16, B10, S10, E17, N10, C11, E18 | 1 | N |
| 6 ABUSE | A17, B10, U11, S40, E18 | 2 | N |
| 6 ABUSE | A17, B10, U11, S20, E18 | 2 | V |
| 6 ACHE V | A40, CH31, E16 | 0 | N |
| 6 ACTION E | A16, C12 | 1 | N |
| 6 ADDITION | | | N |
| 6 ANGLE | A16, N20, G12, LE22 | 3 | 23N |
| 6 ANT | A15, N10, T10 | 0 | N |
| 6 BOW | B40, OW 40 | 0 | N, |
| 6 CUTE P | C12, U11, T10, E18 | 3 | AJ |
| 6 EARRING | EA11, RR10, I15, NG10 | 1 | 34N |
| 6 EDGE | E13, D10, G19, E18 | 0 | N, |
| 6 GET E | G31, E15, T40 | 0 | V |
| 6 GUARD | G12, U20, A21, R10, D10 | 4 | N, |
| 6 HOUSE | H10, OU 10, S21, E18 | 0 | N |
| 6 INVITE | I16, N10, V10, I11, T10, E18 | 2 | V |
| 6 RING | R10, I15, NG10 | 0 | N, |
| 6 ROB | R 0, OB 15, E10 | 1 | V |
| 6 SEPARATE P | S10, E40, P10, A32, R10, A17, T10, E18, | 0 | A |
| 6 SHE | SH10, E25 | 3 | PN |
| 6 SHOVEL V | | | N |
| 6 STRANGE | S10, T10, R10, A40, N10, G11, E18 | 0 | A |
| 6 UNDER PP | U10, N10, D10, E21, R10 | 1 | AV |
| 6XYOLK | Y10, OL 23, L20, K10, | 0 | N |



SOUTHWEST REGIONAL LABORATORY
TECHNICAL NOTE

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REGULAR AND IRREGULAR PRONUNCIATIONS OF GRAPHEMES

Betty Berdiansky and George Stanton

ABSTRACT

A complete listing is given of the various pronunciations of each grapheme in the SWRL reading program. These graphemes are also ordered according to pronunciation variability. The data specifically itemizes the low variability of English graphemes, and indicates the extent to which each grapheme's rules can be compressed for an overview of pronunciations. Based on this information, suggestions are also proposed for revisions in rule numbering, with particular attention given to irregular rules.

¹Section III, regarding rule revisions, of this Technical Note has been deleted for purposes of this Appendix.

REGULAR AND IRREGULAR PRONUNCIATIONS OF GRAPHEMES

The SWRL Reading Program incorporates two types of spelling-to-sound rules of correspondence. The first type, "regular" rules, has predictable pronunciations usually occurring in specifiable environments. The second type, "irregular" rules (numbered as Rule "40"¹), identifies correspondences considered too unproductive to be classified as regular rules, or 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.

This paper is divided into three sections with the following purposes: 1) Section I specifies the number and nature of the pronunciations covered by the regular rules and the "40" (i.e., irregular) rules for each grapheme; 2) Section II lists the graphemes having just one or two pronunciations, separately from those which are less predictable; and 3) Section III suggests improved classifications of the "40" rules and possible changes of some "40" rules to regular rules.

Most Consonant and Secondary Vowel graphemes have only one or two regular pronunciations. And for all Consonants but NG, S, and TH, and for all Secondary Vowels but IE, there is only one regular rule per pronunciation. Primary Vowels, however, each have an average of 6 regular pronunciations covered by 13 rules. Consonants and Secondary Vowels have an average of one or two irregular pronunciations. These "40" rule correspondences involve pronunciations other than those covered by regular rules, except in a minority of cases where one and occasionally two of the "40" pronunciations are the same as regular rules but occur in different environments. Primary vowels, on the other hand, have an average of 7 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 (166, 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--its pronunciation(s)--can be condensed from rules information. Another aspect of this grapheme 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

¹An explanation of the numbering system devised for the rules of correspondence is given in TR15, Berdiansky, Cronnell, & Koehler, 1969, Spelling-sound relations and primary form-class descriptions for speech-comprehension vocabularies of 6-9 year-olds, p. 13.

he will, therefore, have to concentrate more on environment specifications of the Primary Vowel rules for indications of correct pronunciations than he will for other rules.

Section I

Regular and "40" Rule Pronunciations

In Section I, Consonants, Primary Vowels, and Secondary Vowels are listed alphabetically. In brackets, on the same line as each grapheme, are listed all of that grapheme's possible pronunciations. A pronunciation is listed only once per grapheme even if it is covered by more than one of the grapheme rules.

Also listed is the pronunciation(s) for each regular rule, and one example (in capital letters) with the appropriate grapheme underlined. The Block and Unit position of the regular rules in the Sequence of Correspondences is given (e.g., Rule B10 first receives instruction in Block 1, Unit 5).

All base forms of "40" words (irregular words) are listed after the appropriate pronunciations. In order to have a comprehensive list of pronunciations for each grapheme, irregular nonlexicon pronunciations and exemplars are included (and asterisked). Some of these exemplars will also be considered for inclusion in future expanded lexicon studies of correspondence rules.

CONSONANTS

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|-----------------------|---|----------------------|
| B | | [b], [∅] | | |
| | 10 | [b] | BO <u>Y</u> | 1,5 |
| | 20 | [∅] | CO <u>M</u> B | 19,4 |
| | 40 | [∅] | de <u>b</u> t, dou <u>b</u> t | |
| BB | | [b] | | |
| | 10 | [b] | B <u>U</u> BBLE | 1,5 |
| C | | [s], [k], [č], [š] | | |
| | 11 | [s] | <u>C</u> ITY | 7,1 |
| | 12 | [k] | <u>C</u> AT | 4,2 |
| | 40 | [š] | licorice, oce <u>a</u> n, spec <u>i</u> es | |
| | | [s] | mus <u>c</u> le | |
| | E | [š] | spec <u>i</u> al, soc <u>i</u> al grac <u>i</u> ous, prec <u>i</u> ous, spac <u>i</u> ous, vic <u>i</u> ous glac <u>i</u> er | |
| | | [č] | anc <u>i</u> ent consc <u>i</u> ence, consc <u>i</u> ous | |
| CC | 11 | [k], [ks] | ACC <u>ENT</u> | 20,4 |
| | 12 | [k] | HIC <u>CU</u> P | 11,5 |
| | C12,C11 | [ks] | ACC <u>ENT</u> , ACC <u>E</u> PT, SUC <u>CE</u> ED, SUC <u>CE</u> SS | 19,4 |
| CH | | [č], [k], [š], [∅] | | |

| GRAPHIC UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|-----------------------|--|----------------------|
| CH (con't) | 10 | [ç] | <u>C</u> HEAP | 11,2 |
| | 31 | [k] | S <u>C</u> HOO <u>L</u> | 20,2 |
| | 40 | [ʃ] | <u>ch</u> alet, <u>ch</u> amois, <u>ch</u> ampagne, <u>ch</u> auffeur, <u>ch</u> ef, <u>ch</u> ute, <u>ch</u> rochet, <u>ma</u> chine, <u>mo</u> ustache, <u>mu</u> stache, <u>sach</u> et | |
| | | [ø] | y <u>ach</u> t | |
| CK | | [k] | | |
| | 10 | [k] | K <u>ICK</u> | 4,2 |
| D | | [d], [t], [ø], [ʃ] | | |
| | 10 | [d] | <u>DID</u> | 1,4 |
| | 40 | [t] | ch <u>app</u> ed, m <u>ash</u> ed, touch <u>ed</u> ; un <u>wash</u> ed | |
| | | [ø] | ad <u>join</u> , ad <u>join</u> , ad <u>just</u> , grand <u>ma</u> , grand <u>pa</u> , hand <u>some</u> | |
| | 1 | [ʃ] | schedule | |
| | | [ʃ] | cord <u>ial</u> , sold <u>ier</u> | |
| DD | | [d] | | |
| | 10 | [d] | S <u>UDD</u> EN | 1,4 |
| F | | [f], [v] | | |
| | 10 | [f] | <u>FUN</u> | 4,1 |
| | 40 | [v] | o <u>f</u> | |

| GRAPHIC UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|--------------|----------------|-----------------------|---|----------------------|
| FF | | [f] | | |
| | 10 | [f] | <u>OFF</u> | 4,1 |
| G | | [j], [g], [ø], [z] | | |
| | 11 | [j] | <u>AGE</u> | 7,1 |
| | 12 | [g] | <u>GO</u> | 4,3 |
| | 31 | [g] | <u>GET</u> | 11,6 |
| | 40 | [ø] | assign, campaign, champagne, cologne, design, ensign, foreign, gnat, gnaw, reign, resign, sign, sovereign | |
| | | [j] [z] | judgment rouge | |
| GG | | [g], [gʃ] | | |
| | 10 G12, G11 | [g] [gʃ] | <u>EGG</u> suggest | 11,5 11,5 |
| GH | | [ø], [f], [g] | | |
| | 10 | [ø] | <u>HIGH</u> | 19,2 |
| | 40 | [f] | cough, draught, enough, laugh, laughter, rough, tough, trough | |
| | [g] | <u>ghost</u> | | |

| GRAPHIC UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|--------------|-------------|--------------------------|--|----------------------|
| h | | [h], [∅] | | |
| | 10 | [h] | <u>H</u> OME | 1,6 |
| | 20 | [∅] | H <u>U</u> H | 19,2 |
| | 40 | [∅] | dah <u>l</u> ia, ex <u>h</u> aust, ging <u>h</u> am, gra <u>h</u> am, he <u>ir</u> , he <u>ir</u> ess, he <u>rb</u> , ho <u>m</u> age, ho <u>n</u> or, ho <u>u</u> r, kh <u>a</u> ki, raj <u>a</u> h, rh <u>i</u> nestone, rh <u>u</u> barb, rh <u>y</u> me, rh <u>y</u> thm, sheph <u>er</u> d | |
| j | | [j], [h] or [∅], [y]* | | |
| | 10 | [j] | <u>J</u> OY | 4,4 |
| | 40 | [h] or [∅] | fri <u>j</u> oles, mari <u>j</u> uana* | |
| | | [y]* | hallelu <u>j</u> ah* | |
| k | | [k], [∅] | | |
| | 10 | [k] | MIL <u>k</u> | 1,1 |
| | 20 | [∅] | <u>K</u> NOT | 19,3 |
| l | | [l], [∅], [r] | | |
| | 10 | [l] | <u>L</u> IKL | 1,3 |
| | 20 | [∅] | WAL <u>k</u> | 19,5 |

| GRAPHIC UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|--------------|-------------|-----------------------|---|----------------------|
| L (con't) | 40 | [Ø] | could, Lincoln, should, <u>s</u> older would | |
| | | [r] | col <u>o</u> nel | |
| LI | 10 | [l] | F <u>ILL</u> | 1,3 |
| | 40 | [y] | tort <u>ill</u> a | |
| IL | 22 | [əl] | | |
| | | [əl] | L <u>IT</u> TLE | 10,2 |
| M | 10 | [m], [Ø]* | | |
| | | [m] | <u>M</u> AN | 1,5 |
| MM | 40 | [Ø]* | <u>m</u> nemonic*, <u>co</u> mptroller* | |
| | | [m] | | |
| MM | 10 | [m] | S <u>U</u> MMER | 1,5 |
| | | | | |
| N | 10 | [n], [ŋ], [Ø], [n] | | |
| | | [n] | <u>N</u> O | 1,1 |
| | | [ŋ] | S <u>IN</u> K | 4,1 |
| N | 40 | [n] | con <u>cr</u> ete, en <u>g</u> age, in <u>cl</u> ine, in <u>cl</u> ose, in <u>cl</u> ude, in <u>co</u> me, in <u>cr</u> ease, in <u>qu</u> ire | |
| | | | | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|--|---|----------------------|
| N (con't) | | [∅] | autumn <u>n</u> , column <u>n</u> , condem <u>n</u> , lam <u>n</u> , hym <u>n</u> , cole <u>m</u> n, mon <u>n</u> ieur | |
| | | [ñ] | se <u>n</u> or | |
| NN | | [n] | | |
| | 10 | [n] | <u>I</u> NNER | 1,1 |
| NG | | [ŋ], [ŋg], [nj] | | |
| | 10 | [ŋ] | <u>S</u> ING | 5,5 |
| | N20, G12 | [ŋg] | <u>A</u> NGRY, <u>E</u> ngland, <u>E</u> nglish, <u>l</u> anguage, pen <u>g</u> uin | 10,2 |
| | N20, G31 | [ŋg] | <u>A</u> NGER | 11,6 |
| | N10, G11 | [ŋʃ] | <u>D</u> INGY, <u>d</u> ungeon, ven <u>g</u> ence | 10,2 |
| 40 | [ŋ] | l <u>e</u> n <u>g</u> th, str <u>e</u> n <u>g</u> th, ton <u>g</u> ue | | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|----------------|--|----------------------|
| P | | [p], [∅] | | |
| | 10 | [p] | <u>POP</u> | 1,2 |
| | 40 | [∅] | clap <u>board</u> , cor <u>ps</u> , cup <u>board</u> , <u>ps</u> alm, re <u>cept</u> , s <u>app</u> hire | |
| PP | | [p] | | |
| | 10 | [p] | <u>APPLE</u> | 1,2 |
| PH | | [f], [p] | | |
| | 10 | [f] | <u>PHONE</u> | 20,2 |
| | P10,H40 | [p] | shep <u>herd</u> | |
| QU | | [kw], [k] | | |
| | 10 | [kw] | <u>QUICK</u> | 11,4 |
| | 40 | [k] | ant <u>ique</u> , bou <u>quet</u> , con <u>quer</u> , cro <u>quet</u> , lac <u>quer</u> , li <u>quor</u> , mes <u>quite</u> , mos <u>que</u> , pla <u>que</u> , <u>que</u> ue, uni <u>que</u> | |
| R | | [r], [ə] | | |
| | 10 | [r] | <u>RUN</u> | 1,6 |
| | 40 | [ə] | ac <u>re</u> , og <u>re</u> | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|---------------------------------|---|----------------------|
| RR | | [r] | | |
| | 10 | [r] | HUR <u>RY</u> | 1,6 |
| S | | [s], [z], [∅], [ʃ], [ʒ], [č] | | |
| | 10 | [s] | S <u>UN</u> | 1,3 |
| | 20 | [z] | NO <u>S</u> E | 18,2 |
| | 21 | [s] | HO <u>U</u> SE | 18,2 |
| | 31 | [z] | WIV <u>E</u> S | 7,2 |
| | 40 | [s] | ab <u>u</u> se, a <u>s</u> ide, ba <u>s</u> in, ba <u>s</u> is, bi <u>s</u> on, clo <u>s</u> e, cr <u>u</u> sade, decr <u>e</u> ase, do <u>s</u> e, exc <u>u</u> se, ge <u>e</u> se, lea <u>s</u> e, ma <u>s</u> on, me <u>s</u> a, nuis <u>a</u> nce, porpo <u>i</u> se, prom <u>i</u> se, purpo <u>s</u> e, re <u>s</u> earch, re <u>s</u> ource, sau <u>s</u> age, torto <u>i</u> se, u <u>s</u> age, u <u>s</u> e, val <u>i</u> se, v <u>i</u> se | |
| | | [z] | ab <u>s</u> orb, a <u>s</u> , clea <u>n</u> se, cl <u>u</u> msy, co <u>s</u> mos, dis <u>m</u> al, ha <u>s</u> , hi <u>s</u> , hu <u>s</u> band, i <u>s</u> , jerse <u>y</u> , mea <u>s</u> les, mu <u>s</u> lin, ob <u>s</u> erve, pa <u>n</u> sy, pla <u>s</u> ma, Thu <u>r</u> sday, Tues <u>d</u> ay, wa <u>s</u> , Wednes <u>d</u> ay, wis <u>d</u> om | |
| | | [∅] | ai <u>s</u> le, chamo <u>i</u> s, cor <u>p</u> s, i <u>s</u> land, i <u>s</u> le | |
| | | [ʃ] | cat <u>ʃ</u> up, i <u>n</u> sure, su <u>g</u> ar, su <u>r</u> e | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|--|---|----------------------|
| S (con't) | E | [č̣] | con <u>sc</u> ience, con <u>sc</u> ious | |
| | | [ẓ̌] | Asia vi <u>s</u> ion mea <u>s</u> ure, plea <u>s</u> ure, treas <u>u</u> re | |
| | | [ṣ̌] | man <u>s</u> ion, pen <u>s</u> ion, ten <u>s</u> ion | |
| SS | | [s], [ṣ̌], [z] | | |
| | 10 | [s] | MESS | 1,3 |
| | 40 | [ṣ̌] | iss <u>u</u> e, tiss <u>u</u> e | |
| | | [z] | dess <u>er</u> t, diss <u>ol</u> ve, poss <u>ess</u> , sciss <u>or</u> s | |
| E | [ṣ̌] | Russ <u>ian</u> miss <u>ion</u> , sess <u>ion</u> ass <u>ur</u> e, press <u>ur</u> e | | |
| SH | | [ṣ̌] | | |
| | 10 | [ṣ̌] | RUSH | 2,1 |
| T | | [t], [θ], [č̣], [ṣ̌] | | |
| | 10 | [t] | T <u>EN</u> | 1,1 |
| | 20 | [θ] | OF <u>TEN</u> | 19,5 |
| | 40 | [θ] | ballet <u>t</u> , bouquet <u>t</u> , buffet <u>t</u> , chalet <u>t</u> , chestnut <u>t</u> , Christmas <u>t</u> , crochet <u>t</u> , croquet <u>t</u> , depot <u>t</u> , mortgag <u>e</u> , sachet <u>t</u> , valet <u>t</u> | |
| [č̣] | | natur <u>al</u> , stat <u>ue</u> | | |

| GRAPEHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|----------------|-------------|-----------------------|---|----------------------|
| T (con't) | E | [č] | right <u>e</u> ous Christ <u>i</u> an quest <u>i</u> on fort <u>u</u> ne capt <u>u</u> re, creat <u>u</u> re, cult <u>u</u> re, feat <u>u</u> re, fix <u>u</u> re, fract <u>u</u> re, fut <u>u</u> re, lect <u>u</u> re, mix <u>u</u> re, moist <u>u</u> re, nat <u>u</u> re, past <u>u</u> re, pict <u>u</u> re, post <u>u</u> re, punct <u>u</u> re, rapt <u>u</u> re, sculpt <u>u</u> re, stat <u>u</u> re, struct <u>u</u> re, tort <u>u</u> re, vent <u>u</u> re, vult <u>u</u> re | |
| | | [č] or [t] | mat <u>u</u> re | |
| | | [š] | part <u>i</u> al pat <u>i</u> ence pat <u>i</u> ent, quot <u>i</u> ent rat <u>i</u> o caut <u>i</u> ous act <u>i</u> on, auct <u>i</u> on, caut <u>i</u> on, dict <u>i</u> on, fact <u>i</u> on, fict <u>i</u> on, fract <u>i</u> on, frict <u>i</u> on, junct <u>i</u> on, ment <u>i</u> on, mot <u>i</u> on, nat <u>i</u> on, not <u>i</u> on, port <u>i</u> on, pot <u>i</u> on, sect <u>i</u> on, stat <u>i</u> on, tract <u>i</u> on | |
| TT | 10 | [t] [t] | LIT <u>T</u> L <u>E</u> | 1,1 |
| TCH | 10 | [č] [č] | M <u>AT</u> C <u>H</u> | 11,2 |
| TH | 11 | [θ], [ð], [θ], [t] | TH <u>I</u> N | 2,2 |
| | 12 | [ð] | F <u>A</u> TH <u>E</u> R | 20,3 |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|---------------------------|---|----------------------|
| TH (con't) | 13 | [ð] | <u>TH</u> IS | 2,1 |
| | 40 | [ð] | clo <u>th</u> ing, fath <u>o</u> m, heath <u>en</u> , rhyth <u>m</u> , smoo <u>th</u> , swar <u>th</u> y, worth <u>y</u> | |
| | | [θ] | eth <u>er</u> , pan <u>th</u> er | |
| | | [θ] | ast <u>h</u> ma*, clo <u>th</u> es, ist <u>h</u> mus | |
| | | [t]* | th <u>ym</u> e* | |
| V | | [v] | | |
| | 10 | [v] | <u>VER</u> SE | 4,5 |
| W | | [w], [∅] | | |
| | 10 | [w] | <u>W</u> ET | 4,1 |
| | 20 | [∅] | <u>WR</u> ONG | 19,3 |
| | 40 | [∅] | ans <u>w</u> er, s <u>w</u> ord, t <u>w</u> o | |
| WH | | [w] or [hw], [h] | | |
| | 10 | [w] or [hw] | <u>WH</u> EN | 11,3 |
| | 40 | [h] | <u>wh</u> o, <u>wh</u> ole, <u>wh</u> olly, <u>wh</u> om, <u>wh</u> ose | |
| X | | [ks], [gz], [z], [kʰs] | | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|-----------------------|--|----------------------|
| X (con't) | 10 | [ks] | BO <u>X</u> | 4,4 |
| | 40 | [gz] | ex <u>a</u> ct, ex <u>a</u> lt, ex <u>a</u> m, ex <u>e</u> rt, ex <u>a</u> st, ex <u>i</u> st xylophone*, x <u>e</u> rox* | |
| | | [z] | | |
| | E | [kš] | an <u>x</u> ious | |
| Y | | [y] | | |
| | 10 | [y] | <u>Y</u> ES | 4,4 |
| Z | | [z], [s], [∅], [ž] | | |
| | 10 | [z] | <u>Z</u> OO | 4,5 |
| | 40 | [s] | walt <u>z</u> | |
| | | [∅]* | rendez <u>z</u> vous* | |
| | E | [ž] | glaz <u>z</u> ier | |
| ZZ | | [z], [ts] | | |
| | 10 | [z] | <u>B</u> UZZ | 4,5 |
| | 40 | [ts] | pizz <u>z</u> a | |

PRIMARY VOWELS

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|--|---|----------------------|
| A | | [e], [æ], [ə] or [ɪ], [a], [ɔ] [ɛ] or [æ], [a] or [ɔ], [o], [ʊ] | | |
| | 11 | [e] | <u>N</u> AME | 6,1 |
| | 12 | [e] | <u>A</u> CRE | 25,4 |
| | 13 | [e] | <u>B</u> ABY | 18,1 |
| | 14 | [e] | <u>A</u> PRIL | 25,5 |
| | 15 | [æ] | <u>S</u> AT | 1,1 |
| | 16 | [æ] | <u>J</u> ACKET | 8,2 |
| | 17 | [ə] or [ɪ] | <u>M</u> ETAL | 10,1 |
| | 21 | [a] | <u>C</u> AR | 9,1 |
| | 22 | [ɛ] or [æ] | <u>M</u> ARRY | 18,3 |
| | 23 | [ɔ] | <u>B</u> ALL | 13,2 |
| | 24 | [a] or [ɔ] | <u>W</u> AD | 23,1 |
| | 25 | [o] | <u>W</u> AR | 9,3 |
| | 29 | [e] | <u>P</u> ASTE | 23,1 |
| | 32 | [ʊ] | <u>S</u> EPARATE | 27,6 |
| | 38 | [ə] | <u>C</u> AVERN | 24,2 |
| | 40 | [e] | <u>a</u> , <u>a</u> che, <u>a</u> ncient, <u>b</u> ass, <u>b</u> athe, <u>c</u> hamber, champagne <u>h</u> asten, <u>h</u> asty, <u>p</u> aster, <u>p</u> ast <u>r</u> y, <u>s</u> undae, <u>t</u> asty | |
| | | [æ] | <u>a</u> cid, <u>a</u> denoid, <u>a</u> gate, <u>a</u> tom, <u>b</u> aboon, <u>b</u> alance, <u>b</u> anish, <u>c</u> abin, <u>c</u> afe, <u>c</u> amel, <u>c</u> ame <u>r</u> a, <u>c</u> halet, <u>c</u> hamois, <u>c</u> hapel, com <u>r</u> ade, <u>d</u> amage, | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|------------------|----------------|---|--|-------------------------|
| A | 40 (con't) | | dragon, <u>f</u> amine, <u>f</u> ragile, gran <u>i</u> te, <u>h</u> abit, <u>kh</u> aki, Latin, <u>m</u> adam, <u>m</u> agic, <u>m</u> alice, <u>m</u> anage, <u>p</u> ageant, <u>p</u> alace, <u>p</u> anel, <u>p</u> anic, <u>p</u> apoose, <u>p</u> atent, <u>p</u> lanet, <u>p</u> laque, <u>p</u> lateau, <u>p</u> laza, <u>r</u> adish, <u>r</u> apid, <u>s</u> alad, <u>s</u> atin, <u>s</u> aturn, <u>s</u> hadow, <u>s</u> hall, <u>s</u> hallow, <u>s</u> paniel, Spanish, <u>s</u> tatue, <u>s</u> tature, <u>s</u> trata, <u>s</u> wam, <u>t</u> aboo, <u>t</u> alent, <u>t</u> rapeze, <u>v</u> acuum, <u>v</u> alet, <u>v</u> alor, <u>v</u> alue, <u>v</u> anish, <u>w</u> agon | |
| | | [a] | <u>a</u> h, <u>a</u> ha, <u>a</u> lmond, <u>a</u> men <u>a</u> re, <u>b</u> aa, <u>b</u> ah, <u>b</u> aza <u>a</u> r, <u>c</u> alm, <u>d</u> r <u>a</u> ma, <u>f</u> ather, <u>g</u> ar <u>a</u> ge, <u>g</u> rand <u>m</u> a, <u>g</u> rand <u>p</u> a, <u>h</u> a, <u>h</u> urrah, <u>l</u> a, <u>l</u> ava, <u>l</u> lama, <u>m</u> a, <u>p</u> a, <u>p</u> alm, <u>p</u> salm, <u>r</u> aj <u>a</u> h, <u>y</u> acht, <u>y</u> ah | |
| | | [ɔ] | <u>a</u> lmost, <u>a</u> lright, <u>a</u> lso, <u>a</u> lthough, <u>a</u> lways, <u>f</u> alse, <u>w</u> alnut, <u>w</u> alrus | |
| | | [ɛ] | <u>a</u> ny, <u>m</u> any | |
| | | [ə] | <u>w</u> as, <u>w</u> hat | |
| E | | [i], [ɛ], [ə] or [I], [ə], [Ø], [e], [I] or [U] | | |
| | 11 | [i] | <u>H</u> ERE | 6,2 |
| | 13 | [i] | <u>H</u> ERO | 18,1 |
| | 14 | [i] | <u>Z</u> EBRA | 25,5 |
| | 15 | [ɛ] | <u>S</u> ET | 1,4 |
| | 16 | [ɛ] | <u>E</u> XTRA | 8,2 |
| | 17 | [ə] or [I] | <u>H</u> IDDEN | 10,1 |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|----------------|---|----------------------|
| E (con't) | 18 | [Ø] | NAME | 6,1 |
| | 19 | [Ø] | WIVES | 7,2 |
| | 21 | [ə] | HERD | 9,1 |
| | 25 | [i] | WE | 3,1 |
| | 26 | [i] | CREATE | 25,2 |
| | 32 | [Ø] | SEVERAL | 27,6 |
| | 38 | [ε] | EXIT | 25,2 |
| | 40 | [i] | ether, people, recharge | |
| | | [ε] | allege, celery, chemist, cherish, credit, decade, deluge, desert, emerald, ere, federal, general, generous, herald, heron, legend, lemon, leopard, medal, melon, menace, menu, metal, nowhere, pedal, peril, perish, petal, precious, preface, presence, present, rebel, record, reference, refuge, relic, schedule, second, senate, señor, separate, sheriff, special, tenant, there, very, veteran, where | |
| | | [e] | ballet, bouquet, buffet, cafe, chalet, crepe, crochet, croquet, fete, mesa, re, sachet, valet | |
| | | [Ø] | chauffeur, dungeon, Europe, grandeur, luncheon, monsieur, pigeon, queue, surgeon, Wednesday, yeoman | |
| | | [ə] | the, were | |
| | | [I] | England, English | |
| | [I] or [U] | pretty | | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|---|--|----------------------|
| I | | [ay], [I] or [ə], [I], [ə], [y], [∅], [i] | | |
| | 11 | [ay] | F <u>I</u> NE | 6,1 |
| | 12 | [ay] | <u>I</u> DLE | 25,4 |
| | 13 | [ay] | C <u>I</u> DER | 18,1 |
| | 14 | [ay] | <u>I</u> DLY | 25,5 |
| | 15 | [I] | S <u>I</u> T | 1,1 |
| | 16 | [I] | L <u>I</u> TTL <small>E</small> | 8,2 |
| | 17 | [ə] or [I] | OFF <u>I</u> CE | 10,1 |
| | 21 | [ə] | B <u>I</u> RD | 9,1 |
| | 22 | [ay] | F <u>I</u> ND | 13,3 |
| | 24 | [ay] | H <u>I</u> GH | 19,2 |
| | 25 | [y] | ON <u>I</u> ON | 23,2 |
| | 26 | [ay] | L <u>I</u> AR | 25,2 |
| | 32 | [∅] | AS <u>P</u> IRIN | 27,6 |
| | 38 | [I] | R <u>I</u> VER | 24,2 |
| | 40 | [ay] | Christ, c <u>i</u> pher, cl <u>i</u> mb, h <u>i</u> , <u>I</u> , <u>i</u> sland, n <u>i</u> nth, p <u>i</u> nt, s <u>i</u> phon | |
| | | [I] | c <u>i</u> ty, ch <u>i</u> li, cl <u>i</u> nic, f <u>i</u> gure, f <u>i</u> nish, fr <u>i</u> gid, gu <u>i</u> nea, guitar, im <u>a</u> ge, lib <u>e</u> ral, lic <u>o</u> rice, l <u>i</u> ly, l <u>i</u> mit, l <u>i</u> nen, l <u>i</u> quid, l <u>i</u> quor, l <u>i</u> zard, m <u>i</u> m <u>i</u> c, m <u>i</u> nute, p <u>i</u> geon, p <u>i</u> ty, p <u>r</u> imer, p <u>r</u> ison, r <u>i</u> sen, s <u>i</u> n <u>e</u> w, sp <u>i</u> got, sp <u>i</u> nach, sp <u>i</u> rit, t <u>i</u> mid, t <u>r</u> ibute, v <u>i</u> cious, v <u>i</u> gor, v <u>i</u> neyard, v <u>i</u> sion, v <u>i</u> sit, w <u>i</u> dow, w <u>i</u> nd, w <u>i</u> zard | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|---|--|----------------------|
| I | 40 (con't) | [i] | ant <u>i</u> que, chili <u>i</u> , chlor <u>i</u> ne, fat <u>i</u> gue, fi <u>o</u> rd, Hop <u>i</u> , khaki <u>i</u> , mach <u>i</u> ne, mar <u>i</u> ne, mesqu <u>i</u> te, mi <u>i</u> , mobile, p <u>i</u> zza, pol <u>i</u> ce, rav <u>i</u> ne, sard <u>i</u> ne, ski <u>i</u> , su <u>i</u> te, tax <u>i</u> , ti <u>i</u> , un <u>i</u> que, vacc <u>i</u> ne, val <u>i</u> se | |
| | | [ø] | bus <u>i</u> ness, fash <u>i</u> on, leg <u>i</u> on, marri <u>a</u> ge, reg <u>i</u> on | |
| 0 | | [o], [a], [ə] or [ɪ], [ə], [ɪ], [ø], [a] or [o] or [ɔ], [ɔ] or [a], [u], [U], [wə], [ə] | | |
| | 11 | [o] | H <u>O</u> ME | 6,2 |
| | 12 | [o] | N <u>O</u> BLE | 25,4 |
| | 13 | [o] | N <u>O</u> TICE | 18,1 |
| | 14 | [o] | <u>O</u> NLY | 25,5 |
| | 15 | [a] | L <u>O</u> T | 1,6 |
| | 16 | [a] | H <u>O</u> CKEY | 8,2 |
| | 17 | [ə] or [ɪ] | C <u>O</u> TTON | 10,1 |
| | 21 | [a] or [o] or [ɔ] | H <u>O</u> RN | 9,1 |
| | 22 | [ə] | W <u>O</u> RD | 9,3 |
| | 23 | [o] | G <u>O</u> LD | 13,2 |
| | 24 | [ɔ] or [a] | S <u>O</u> NG | 13,3 |
| | 25 | [o] | G <u>O</u> | 18,4 |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|-----------------------------|---|----------------------|
| o (con't) | 26 | [o] | PO <u>EM</u> | 25,2 |
| | 31 | [ə] | W <u>ON</u> | 13,1 |
| | 32 | [∅] | SOPH <u>OMORE</u> | 27,6 |
| | 38 | [a] | NO <u>VEL</u> | 24,2 |
| | 40 | [o] | al <u>mo</u> st, bo <u>th</u> , clo <u>th</u> e, clo <u>th</u> es, col <u>o</u> gne, co <u>m</u> b, co <u>n</u> tro <u>l</u> , cro <u>ch</u> et, de <u>p</u> ot, gh <u>o</u> st, go <u>p</u> her, gr <u>o</u> ss, ho <u>l</u> ster, ho <u>s</u> t, ho <u>s</u> tess, mo <u>s</u> t, <u>O</u> , o <u>h</u> , pa <u>t</u> ro <u>l</u> , po <u>s</u> t, po <u>s</u> tage, po <u>s</u> tal, po <u>s</u> ter, po <u>s</u> tpon <u>e</u> , so <u>l</u> , so <u>l</u> dier, tro <u>p</u> hy, ut <u>m</u> ost, wh <u>o</u> lly | |
| | | [a] | bo <u>d</u> y, cho <u>co</u> late, chro <u>n</u> ic, clo <u>s</u> et, co <u>l</u> umn, co <u>m</u> et, co <u>p</u> y, fro <u>l</u> ic, ho <u>m</u> age, ho <u>n</u> est, ho <u>n</u> or, mo <u>d</u> el, mo <u>d</u> ern, mo <u>d</u> est, mo <u>n</u> arch, o <u>l</u> ive, pho <u>n</u> ic, po <u>l</u> ish, pro <u>ce</u> ss, pro <u>d</u> uct, pro <u>f</u> it, pro <u>je</u> ct, pro <u>m</u> ise, pro <u>p</u> er, ro <u>b</u> in, ro <u>s</u> in, scho <u>l</u> ar, so <u>l</u> emn, so <u>l</u> id, to <u>n</u> ic, to <u>p</u> ic, tro <u>p</u> ic, vo <u>l</u> ume, vo <u>m</u> it | |
| | | [u] | do, im <u>p</u> ro <u>v</u> e, lo <u>s</u> e, mo <u>v</u> e, mo <u>vi</u> e, pro <u>v</u> e, re <u>m</u> ove, to, to <u>m</u> b, to <u>w</u> o, who, who <u>m</u> , who <u>s</u> e | |
| | | [∅] | co <u>l</u> onel, ir <u>o</u> n, le <u>o</u> p <u>a</u> rd, pe <u>o</u> ple | |
| | | [a] or [ɔ] | be <u>g</u> one, go <u>l</u> f, go <u>n</u> e, sw <u>o</u> llen | |
| | | [U] | bo <u>s</u> om, wo <u>l</u> f, wo <u>l</u> ves, wo <u>m</u> an | |
| | [wə] | o <u>n</u> ce, o <u>n</u> e | | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|---------------------------------------|-------------------|---|----------------------|
| O | 40 (con't) | [I] | w <u>o</u> men | |
| | | [ə] | co <u>l</u> onel | |
| | | [ə] or [u] or [∅] | to <u>u</u> ard | |
| U | EAU | [o] or [yu] | | |
| | 11 | [(y)u] | <u>U</u> SE | 6,2 |
| | 12 | [(y)u] | <u>B</u> UGLE | 25,4 |
| | 13 | [(y)u] | <u>U</u> NIT | 18,1 |
| | 14 | [(y)u] | <u>B</u> UGLER | 25,5 |
| | 15 | [ə] | <u>G</u> UM | 1,6 |
| | 16 | [ə] | <u>S</u> UDDEN | 8,2 |
| | 17 | [ə] or [I] | LE <u>T</u> TUCE | 10,1 |
| | 20 | [∅] | <u>G</u> UARD | 19,6 |
| | 21 (formerly U15 & U16 /__r) | [ə] | <u>B</u> URN | 9,1 |
| | 26 | [(y)u] | <u>R</u> UIN | 25,6 |
| | 31 | [U] | <u>P</u> USH | 13,1 |
| | 32 | [∅] | <u>N</u> A <u>T</u> URAL | 27,6 |
| | 40 | [w] | j <u>a</u> guar, lang <u>u</u> age, pen <u>u</u> in, pers <u>u</u> ade, p <u>u</u> eblo, s <u>u</u> ite | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|---------------|---|--|----------------------|
| U | 40 (con't) | [ə] | pun <u>ish</u> , stud <u>y</u> , sub <u>urb</u> | |
| | | [u] | cuckoo, flu <u>,</u> tru <u>th</u> | |
| | | [yu] | men <u>u</u> , vacu <u>um</u> | |
| | | [I] | bu <u>ss</u> ness, bu <u>s</u> y | |
| | | [Ø] | bu <u>y</u> , dis <u>gu</u> ise | |
| | | [ε] | bu <u>r</u> y | |
| | | [U] | sug <u>a</u> r | |
| LAU | U40 + EA40 | [o] | ' <u>e</u> au, bu <u>r</u> eau, pl <u>a</u> teau | |
| | | [yu] | be <u>a</u> ty | |
| Y | | [ay], [I], [i] or [I], [ə], [ə] or [I] | | |
| | 11 | [ay] | R <u>HY</u> ME | 23,3 |
| | 15 | [I] | M <u>Y</u> TH | 23,3 |
| | 17 | [i] or [I] | B <u>A</u> B <u>Y</u> | 10,2 |
| | 19 | [ay] | T <u>R</u> Y | 3,2 |
| | 40 | [ay] | by <u>e</u> , dy <u>e</u> , hy <u>ph</u> en, ly <u>e</u> , ry <u>e</u> , scy <u>th</u> e, ty <u>ph</u> oid, ty <u>ph</u> oon | |
| | | [I] | ph <u>ys</u> ics, Ply <u>m</u> outh | |
| | | [ə] | mar <u>ty</u> r, my <u>rr</u> h | |
| | [ə] or [I] | sy <u>r</u> up | | |

SECONDARY VOWELS

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|--|--|----------------------|
| AI | | [e], [ə] or [ɪ], [ɛ], [ay], [æ] | | |
| | 10 | [e] | <u>RAIN</u> | 16,1 |
| | 17 | [ə] or [ɪ] | <u>CAPTAIN</u> | 26,3 |
| | 40 | [ɛ] | <u>again</u> , <u>said</u> | |
| | | [ay] [æ] | <u>aisle</u> , <u>kaiak</u> <u>plaid</u> | |
| AY | | [e], [ay] | | |
| | 11 | [e] | <u>DAY</u> | 12,1 |
| | 40 | [ay] | <u>aye</u> | |
| AU | | [ɔ], [æ] or [s], [æ], [o], [∅] | | |
| | 10 | [ɔ] | <u>CAUSE</u> | 16,4 |
| | 40 | [æ] or [a] | <u>aunt</u> | |
| | | [æ] | <u>draught</u> , <u>laugh</u> <u>laughter</u> | |
| | | [o] | <u>chauffeur</u> | |
| | | [∅] | <u>restaurant</u> | |
| AW | | [ɔ] | | |
| | 10 | [ɔ] | <u>SAW</u> | 16,4 |
| EA | | [ɪ], [ɛ], [ə] or [ɪ], [ə], [e], [a] | | |
| | EA | [o], [yu] | | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|---------------|-----------------------------|---|----------------------|
| EA (con't) | 11 | [i] | <u>EACH</u> | 12,2 |
| | 31 | [ɛ] | <u>DEAF</u> | 12,2 |
| | 33 | [ə] | <u>EARN</u> | 26,4 |
| | 40 | [e] | <u>break</u> , <u>great</u> , <u>steak</u> , <u>yea</u> | |
| | | [a] | <u>heart</u> , <u>hearth</u> | |
| | | [ə] or [I] | <u>ocean</u> , <u>pageant</u> , <u>sergeant</u> , <u>vengeance</u> | |
| EAU | 1A40 + U40 | [o] | <u>beau</u> , <u>bureau</u> , <u>plat<u>cau</u></u> | |
| | | [yu] | <u>beauty</u> | |
| EE | | [i], [I], [e]* | | |
| | 10 | [i] | <u>SEE</u> | 3,1 |
| | 40 | [I] | <u>been</u> , <u>breeches</u> , <u>creek</u> | |
| | | [e]* | <u>matinee*</u> , <u>melee*</u> | |
| EI | | [i], [e], [I], [ay], [ɛ] | | |
| | 10 | [i] | <u>CEILING</u> | 26,5 |
| | 20 | [e] | <u>NEIGHBOR</u> | 26,6 |
| | 40 | [I] | <u>foreign</u> , <u>forfeit</u> | |
| | | [ay] | <u>height</u> | |
| | | [ɛ] | <u>heifer</u> , <u>heir</u> , <u>heiress</u> , <u>their</u> | |
| | [e] | <u>veil</u> | | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|---------------------------------|---|----------------------|
| EW | | [(y)u], [o] | | |
| | 10 | [(y)u] | <u>NE</u> W | 16,6 |
| | 40 | [o] | se <u>W</u> | |
| EY | | [e], [i], [ay] | | |
| | 10 | [e] | OB <u>E</u> Y | 26,6 |
| | 17 | [i] | M <u>O</u> NEY | 26,2 |
| | 40 | [ay] | <u>ey</u> e, ge <u>ys</u> er | |
| | | [i] | ke <u>y</u> | |
| IE | | [ay], [i], [ɛ], [I], [I] or [ə] | | |
| | 11 | [ay] | D <u>I</u> E | 19,2 |
| | 12 | [i] | F <u>I</u> E <u>L</u> D | 26,5 |
| | 17 | [i] | M <u>O</u> V <u>I</u> E | 26,2 |
| | 40 | [ɛ] | fr <u>i</u> end | |
| | | [I] | s <u>i</u> eve | |
| | | [I] or [ə] | ker <u>ch</u> ief, mis <u>ch</u> ief | |
| OA | | [o], [ɔ], [ə] | | |
| | 10 | [o] | CO <u>A</u> T | 16,3 |
| | 40 | [ɔ] | ab <u>ro</u> ad, br <u>oa</u> d, br <u>oa</u> dcast | |
| | | [ə] | cl <u>a</u> p <u>bo</u> ard, cu <u>p</u> bo <u>a</u> rd | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|-------------------------------------|--------------------------------------|----------------------|
| OL | | [o], [u], [ə] | | |
| | 10 | [o] | TO <u>E</u> | 16,3 |
| | 40 | [u] | cano <u>e</u> , sho <u>e</u> | |
| | | [ə] | do <u>e</u> s | |
| | | [o] | go <u>e</u> s | |
| OI | | [oy], [i], [way], [ə] or [I] | | |
| | 10 | [oy] | NO <u>I</u> SE | 16,5 |
| | 40 | [i] | cham <u>i</u> s | |
| | | [way] | cho <u>i</u> r | |
| | | [ə] or [I] | porpo <u>i</u> se, torto <u>i</u> se | |
| OO | | [u], [U], [ə], [o] | | |
| | 11 | [u] | TO <u>O</u> L | 12,3 |
| | 12 | [U] | BO <u>O</u> K | 12,3 |
| | 40 | [ə] | bloo <u>o</u> d, floo <u>o</u> d | |
| | | [o] | do <u>o</u> r, floo <u>o</u> r | |
| OU | | [aw], [ə], [(y)u], [ɔ], [o], [U] | | |
| | 10 | [aw] | CO <u>U</u> T | 16,2 |
| | 31 | [ə] | YO <u>U</u> NG | 26,7 |
| | 33 | [(y)u] | GR <u>OU</u> P | 26,7 |
| | 34 | [ɔ] | FO <u>U</u> GHT | 26,7 |
| 35 | [o] | SO <u>U</u> L | 26,7 | |

| GRAPHEME UNIT | RULE NUMBER | PRONUNCIATIONS | EXAMPLE | POSITION IN SEQUENCE |
|---------------|-------------|---------------------------------------|--|----------------------|
| OU (con't) | 40 | [U] | <u>could</u> , <u>should</u> , <u>would</u> | |
| OW | | [o], [o] or [ə], [aw], [a] | | |
| | 11 | [o] | <u>GLOW</u> | 12,4 |
| | | [o] or [ə] in unstressed syllables | <u>YELLOW</u> | |
| | 12 | [aw] | <u>NOW</u> | 12,4 |
| | 40 | [a] | <u>know</u> ledge | |
| OY | | [oy], [i] | | |
| | 10 | [oy] | <u>BOY</u> | 16,5 |
| | 40 | [i] | <u>buoy</u> | |
| UE | | [(y)u], [∅] | | |
| | 10 | [(y)u] | <u>BLUE</u> | 16,6 |
| | 40 | [∅] | <u>fatigue</u> , <u>league</u> , <u>plague</u> , <u>queue</u> , <u>rogue</u> , <u>tongue</u> | |
| UI | | [(y)u], [I] | | |
| | 10 | [(y)u] | <u>FRUIT</u> | 16,6 |
| | 31 | [I] | <u>BUILD</u> | 26,8 |
| EW | | | | |

Section II

Graphemes Grouped According to Pronunciation Variability

The purpose of grouping graphemes by their degree of pronunciation variability was to determine which graphemes could, instructionally, have just one or two pronunciations associated with them with little or no emphasis on environmental information, and which would require information about the position of the grapheme in that exemplar to determine the pronunciation.

Five categories of pronunciation variability are listed. Beginning with graphemes having invariant pronunciations, the categories are presented in order of increasing grapheme pronunciation variability. Within each category, the order of graphemes is: single consonants, geminate consonants, digraphs, primary vowels, and secondary vowels. These subgroups are separated by a dotted line.

If a grapheme has irregular correspondences with pronunciations not covered by that grapheme's regular rules, these particular exemplars are listed. No regular words, and no "40" words having the same pronunciation as regular rules, are listed.

In order to have a comprehensive list of pronunciations for each grapheme, irregular nonlexicon pronunciations and exemplars are included (and asterisked).

The data indicates that geminate 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 could not be fit into this description (by acknowledging automatic selection by the reader of the correct allophones for D and N, for example) are C, G, S, and T. Consonant digraphs have one or sometimes two pronunciations, with the exceptions being CH and NG (and the latter's pronunciation depends on environment). 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.

INVARIANT PRONUNCIATIONS

| | | | | |
|-------|------|--|-------|------|
| M | [m] | | CK | [k] |
| | [∅]* | <u>m</u> neumonics*, <u>co</u> mp <u>t</u> roller* | | |
| V | [v] | | LE | [əl] |
| ----- | | | SH | [ʃ] |
| BB | [b] | | TCH | [tʃ] |
| DD | [d] | | ----- | |
| FF | [f] | | AW | [ɔ] |
| MM | [m] | | | |
| NN | [n] | | | |
| PP | [p] | | | |
| RR | [r] | | | |
| TT | [t] | | | |
| ----- | | | | |

ONE MAJOR PRONUNCIATION WITH 1-6 EXCEPTIONS

| | | | |
|-------|--|----|--|
| F | [f] [v] of | AU | [ɔ] [æ] or [a] <u>au</u> nt [æ] <u>laugh</u> [o] <u>chauffeur</u> [∅] <u>restaurant</u> |
| J | [j] [h] or [∅] <u>frijoles</u> , <u>marijuana</u> * [y]* <u>hallelujah</u> * | AY | [e] [ay] <u>aye</u> |
| R | [r] [ə] <u>acre</u> , <u>ogre</u> | EE | [i] [I] <u>been</u> , <u>breeches</u> , <u>creek</u> [e]* <u>matinee</u> *, <u>melee</u> * |
| Z | [z] [s] <u>waltz</u> [ʒ] <u>glazier</u> [∅]* <u>rendezvous</u> * | EW | [(y)u] [o] <u>sew</u> |
| ----- | | | |
| CC | [k] [ks] <u>accent</u> , <u>accept</u> , <u>succeed</u> , <u>success</u> | OA | [o] [ɔ] <u>broad</u> [ə] <u>clapboard</u> , <u>cupboard</u> |
| GG | [g] [gʒ] <u>suggest</u> | OE | [o] [u] <u>canoe</u> , <u>shoe</u> [ə] <u>does</u> |
| LL | [l] [y] <u>tortilla</u> | OI | [oy] [i] <u>chamois</u> [way] <u>choir</u> [ə] or [I] <u>propoise</u> , <u>tortoise</u> |
| ZZ | [z] [ts] <u>pizza</u> | OY | [oy] [i] <u>buoy</u> |
| ----- | | | |
| PH | [f] [p] <u>shepherd</u> | UE | [(y)u] [∅] <u>fatigue</u> , <u>league</u> , <u>plague</u> , <u>queue</u> , <u>rogue</u> , <u>tongue</u> |
| WH | [w] or [hw] [h] <u>who</u> , <u>whole</u> , <u>wholly</u> , <u>whom</u> , <u>whose</u> | | |
| ----- | | | |

TWO PRONUNCIATIONS

| | | | | |
|---|----------------------|----|----------------------|--|
| B | [b] [∅] | QU | [kw] [k] | ant <u>iq</u> ue, bou <u>q</u> uet, con <u>q</u> uer, cro <u>q</u> uet, lac <u>q</u> uer, li <u>q</u> uor |
| H | [h] [∅] | | | mes <u>q</u> uite, mos <u>q</u> ue, pla <u>q</u> ue, <u>q</u> ueue, uni <u>q</u> ue |
| K | [k] [∅] | UI | [(y)u] [I] or [ə] | |
| P | [p] [∅] | | | clap <u>p</u> oard, corp <u>s</u> , cup <u>p</u> oard, psalm, re <u>p</u> ceipt, sapp <u>p</u> hire, p <u>p</u> seudo,* ps <u>p</u> ychology,* p <u>p</u> neumonia,* ptom <u>p</u> aine* |
| W | [w] [∅] | | | |
| X | [ks] [gz] [z]* | | | ex <u>x</u> act, ex <u>x</u> alt, ex <u>x</u> am, ex <u>x</u> ert, ex <u>x</u> haust, ex <u>x</u> ist, xylo <u>x</u> ophone,* <u>x</u> er <u>x</u> o* |

TWO PRONUNCIATIONS WITH 1-6 EXCEPTIONS

L [ɪ]
 [ʊ]
 [r] colonel

GH [ʊ]
 [f] cough, draught,
 enough, laugh,
 laughter, rough,
 tough, trough
 [g] ghost

TH [θ]
 [ð]
 [ʊ] clothes, isthmus,
 asthma*
 [t]* thyme*

AI [e]
 [ə] or [ɪ]
 [ɛ] again, against,
 said
 [ay] aisle, kaiak
 [æ] plaid

EI [i]
 [e]
 [ɪ] foreign, forfeit
 [ay] height
 [ɛ] heifer, heir, their

EY [e]
 [i]
 [ay] eye, geyser

IE [ay]
 [i]
 [ɛ] friend
 [ɪ] sieve
 [ɪ] or [ə] kerchief,
 mischief

OO [u]
 [ʊ]
 [ə] blood, flood
 [o] door, floor

OW [o]
 [aw]
 [a] knowoledge

THREE OR MORE PRONUNCIATIONS

| | | | | | |
|-------|---------------------------------|---|----|--|--|
| C | [k] [s] [ç] [ʃ] | "E" words licorice, ocean, species, + "E" words | SS | [s] [z] [ʒ] | dessert, dessolve, possess, scissors issue, tissue, + "E" words |
| ----- | | | | | |
| D | [d] [t] [∅] [ʃ] | chapped, mashed, touched, unwashed adjorn, adjourn, adjust, grandma, grandpa, handsome, schedule, soldier | CH | [ç] [k] [ʃ] [∅] | chalet, chamois, champagne, chauffeur, chef, chute, crochet, machine, moustache, mustache, sachet yacht |
| G | [g] [ʒ] [∅] [ʒ] | assign, campaign, champagne, cologne, design, ensign, foreign, gnat, gnaw, reign, resign, sign, rouge | NG | [ŋ] [ŋg] [nʒ] [nʒ]* | N20,G12 words, N20,G31 words N10,G11 words lingerie* |
| ----- | | | | | |
| N | [n] [ŋ] [∅] [n] | autumn, column, condemn hymn, solemn, monsieur señor | A | [æ] [e] [a] [ə] or [ɪ] [ɔ] [ɛ] [o] [∅] [ə] | was, what |
| S | [s] [z] [ʃ] [ʒ] [∅] | satsup, insure, sugar, sure, + "E" words "E" words aisle, chamois, corps, isle | E | [ɛ] [i] [ə] or [ɪ] [∅] [e] | ballet, bouquet, buffet, cafe, chalet, crepe, crochet, croquet, fete, mesa, re, sachet, valet |
| T | [t] [∅] [ç] [ʃ] | natural, statue, + "E" words "i" words | | [ɪ] or [U] [e] or [ɛ] | pretty ere, where |

Three or more pronunciations (con't)

| | |
|---|---|
| <p>I</p> <p>[I] [ay] [ə] or [I] [ə] [y] [Ø] [i] ant<u>ique</u>, ch<u>ili</u>, chl<u>orine</u>, fat<u>igue</u>, f<u>ior</u>d, Hop<u>i</u>, khak<u>i</u>, mach<u>ine</u>, mar<u>ine</u>, mesqu<u>ite</u>, m<u>i</u>, mob<u>ile</u>, p<u>izz</u>a, pol<u>ice</u>, rav<u>ine</u>, sarg<u>ine</u>, ski<u>,</u> su<u>ite</u>, tax<u>i</u>, t<u>i</u>, un<u>ique</u>, vacc<u>ine</u>, val<u>ise</u></p> | <p>Y</p> <p>[ay] [i] [i] or [I] [ə] mart<u>yr</u>, myrr<u>h</u> [ə] or [I] syr<u>up</u></p> <hr style="border-top: 1px dashed black;"/> <p>EA</p> <p>[i] [e] [ə] [e] br<u>ea</u>k, gr<u>ea</u>t, st<u>ea</u>k, y<u>ea</u> [a] h<u>ea</u>rt, h<u>ea</u>rth [ə] or [I] oce<u>an</u>, pag<u>ea</u>nt, serg<u>ea</u>nt, veng<u>ea</u>nce (EAU [o] be<u>au</u>, bure<u>au</u>, plate<u>au</u>) [yu] be<u>au</u>ty</p> <p>OU</p> <p>[uw] [ə] [(y)u] [ɔ] [o] [U] cou<u>ld</u>, shou<u>ld</u>, wou<u>ld</u></p> |
| <p>O</p> <p>[a] [o] [ə] [ɔ] [Ø] [ə] or [I] [ɔ] or [a] [a], [e] or [ɔ] [u] do<u>,</u> impr<u>ove</u>, los<u>e</u>, mov<u>e</u>, mov<u>ie</u>, prov<u>e</u>, rem<u>ove</u>, to<u>,</u> tom<u>b</u>, tw<u>o</u>, wh<u>o</u>, wh<u>om</u>, wh<u>ose</u> [U] wol<u>f</u>, w<u>om</u>an, bos<u>om</u> [wə] on<u>e</u>, onc<u>e</u> [I] w<u>om</u>en [ə] col<u>on</u>el [ə] or [u] or [Ø] tow<u>ard</u></p> | |
| <p>U</p> <p>[(y)u] [ə] [Ø] [ə] or [I] [U] [ɔ] [I] bur<u>y</u> [I] bus<u>ine</u>ss, bus<u>y</u> [w] jag<u>uar</u>, lang<u>ua</u>ge, penqu<u>in</u>, pers<u>ua</u>de, pueb<u>l</u>o, su<u>ite</u> (EAU [o] be<u>au</u>, bure<u>au</u>, plate<u>au</u>) [yu] be<u>au</u>ty</p> | |

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