

SPELLING FOR LEARNING

English Spelling for Teachers and Learners

by

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Preface

The ingredients of language are words and rules. Words in the sense of memorized links between sound and meaning; rules in the sense of operations that assemble the words into combinations whose meanings can be computed from the meanings of the words and the way they are arranged. (Steven Pinker, *Words and Rules*, 1999, p. 269)

Pinker's distinction between words and rules is a distinction between arbitrary lists, which must be memorized, and ruly patterns, which can lead to predictable results, thus reducing brute memorization. Pinker uses the distinction to discuss the differences between regular verbs, which are governed by the simple rule "Add the suffix *-ed* to show past tense," and irregular verbs, such as *sing* vs. *sang*, *bring* vs. *brought*, which must be memorized. But the distinction is powerful enough to help us better understand things other than regular and irregular verbs. It can, for instance, help us understand English spelling.

Of course, Pinker is mainly concerned with the spoken language, not the written. And there most surely are differences between how the human mind learns, on one hand, to speak and listen and, on the other, to write and read – and thus spell. Humans seem to be genetically predisposed to learn their native spoken language with much the same natural ease and relentless inevitability with which they learn to walk. But such is not true of learning their native written language. If learning to speak and listen is like learning to walk, learning to read and write (and spell) is like learning to dance. For learning to read and write is seldom easy and surely not inevitable. And yet, Pinker's distinction between words and rules can still help us discuss English spelling.

Pinker points out that although irregular verbs can not be made obedient to any large and all-encompassing rules, they are not utterly random and without pattern. They are shot through with strands of family resemblance that create small groups and patterns. And these smaller, more local patterns can relieve some of the burden on brute memory. For rules and patterns of any size represent unifying simplicities that can make learning easier. *Spelling for Learning* emphasizes those simplifying rules and patterns.

Words consist essentially of an arbitrarily agreed-upon connection between sound and meaning, and arbitrariness always makes heavy demands on memory. But this arbitrariness is not complete and total. As language grows and evolves, patterns emerge and develop, and the description of those patterns leads to recognized rules. For instance, though it is an essentially arbitrary relationship between the sound [kat] and the meaning "feline," the fact that we spell that sound and meaning <c>, <a>, <t> is

considerably less arbitrary.¹ Rules and patterns are being followed, agreed-upon expectations are being fulfilled to a degree that they would not be in spellings such as <kat> or <qat> or <caght> or <ckatt>. Those rules and patterns and expectations provide a motivation for the spelling <cat> that eases the arbitrariness and thus the demands made on one's memory. This motivation increases when we think of ruly inflected forms like *cats* and *catted*, or derived forms like *catty*, and compounds like *catfish*, all of which submit to a network of rules and subrules and expectations. *Spelling for Learning* presents many of those rules and subrules and patterns so as to increase the reader's sense of efficient motivation.

Those rules and patterns include the major and minor sound-to-spelling correspondences, generally called *phonics*. But I believe that we cannot get very far describing these correspondences without looking at the way words are constructed, at the procedures that help us maintain these correspondences when we form words, and at historical processes that have complicated the correspondences between sounds and their spellings. I believe that the debate over phonics, word-attack, and other approaches to teaching spelling and reading can be resolved, or at least tempered, if we recognize a developmental sequence at work: There is clearly a phonetic (or phonic) stage that nearly all people go through as they first begin to learn to read and write, a stage they **must** go through. But just as most readers and writers must go through this stage, they must go **through** it. They can't spend the rest of their lives worrying about sound-and-spelling correspondences. So after they have been "phoneticized," as it were, they must then be "de-phoneticized," which means that they must begin to think of words as having a ruly structure of meaning-bearing parts.

Chapter one discusses the basic units of spelling: the letters and sounds of English. It also presents a careful distinction between vowels and consonants, both sounds and letters. Chapter two discusses the meaning-bearing parts of written words, here called *elements*—prefixes, bases, and suffixes. Chapter three discusses four of the procedures that are involved when these elements combine to form written words. The first, and most common, of these procedures is *simple addition*, in which elements simply add together with no changes, as in *unearthly*: un+earth+ly. The other three procedures all involve changes, either the insertion of a letter, as in *twinning* = twin+n+ing; or the deletion of a letter, as in *deletion* = delet+ion; or the replacing of one letter with another, as in *dried* = dry+i+ed. Chapter four discusses three historical processes, which, though patterned and more or less predictable, do complicate the sound-to-spelling correspondences: (i) the assimilation of final consonants in many prefixes (as when the negative prefix *in-* changes to *il-* before <l>, as in *illegal* and *illegible*); (ii) the palatalization of certain sounds so that consonant letters that normally spell sounds regularly associated with them spell sounds pronounced further back in the mouth, against the palate, as, for instance, when the <t>, regularly associated with

¹For an explanation of the various brackets used here, see immediately below: "A Note on the Symbols Used."

the sound [t], as in *native*, spells the sound [ʃh], as in the related word *nation*; and (iii) the shortening of certain vowels that we would expect to be long, as with the stressed vowel sounds spelled <e> in *competitor* (compare the long <e> in *compete*), *serenity* (compare *serene*), and *lemon* (compare *demon*).

The material presented in chapters one through four makes it possible for chapter five to treat in some detail the patterns and rules governing English sound-to-spelling correspondences. In this discussion the more ruly major correspondences are like Pinker's regular verbs, controlled by fairly large and reliable rules and patterns; the less ruly, sometimes quite idiosyncratic minor correspondences are like those items that must be memorized.

A Note on the Symbols Used. In the main text words and elements are printed in italics with prefixes and suffixes marked with following or leading hyphens: *paint*, *re-*, *-ed*. The analyses of words into their elements are printed in serif typeface with boundaries between elements marked with plus signs: *re+paint+ed*. Letters and spellings are printed inside corner brackets: , <bat>. Individual sounds and the pronunciations of words and elements are printed inside square brackets: [rē], [pānt], [id]. Inside square brackets syllable boundaries are marked with small hyphens. Vowels with primary stress are printed in large boldface: [ə-**bu**v], *above*; vowels with secondary stress are printed in regular size bold: [d**ī**ph-**th**ong], *diphthong*. Definitions are printed inside double quotes. Sets of closely related elements are printed in italics inside curly braces: {*ceed*, *cess*} as in *succeed*, *success*. Deleted letters are marked with an overstruck slash mark: *ø*. A preceding asterisk indicates a spelling or analysis that is incorrect or anomalous: *<deadder>. An asterisk following a word means that the word has a relevant variant pronunciation or spelling or both.

The exercises at the end of the book offer interactive work with the concepts and analyses presented in the following chapters. The relevant exercises are identified in the text by right-justified bold-faced cross-references. For more detailed discussions of these concepts and analyses, see my *American English Spelling* (Johns Hopkins UP, 1988) (hereafter *AES*). For the application of these concepts in lessons for spelling students, see *The Basic Speller* at dwcummings.com and ck12.org.

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1 Letters and Sounds

Analysis

When learning to spell, it helps to understand how words work — what their important parts are and how those parts work together. When you take something apart, or just think about it in terms of its parts, so that you can begin to understand it better, you **analyze** it. (Our word *analyze* comes from a Greek word that meant “to undo.” The prefix *ana-* means “throughout”; the base *lyze* means “loosen.”)

Words can be analyzed, or taken apart, in many different ways. For instance, when you think about it as something spoken, the word *sixteenth* can be analyzed into eight **sounds**:

[s]+ [i]+ [k]+ [s]+ [t]+ [ē]+ [n]+ [th]

Or it can be analyzed into two larger sound units that each contain one vowel sound and any attendant consonants, and are called **syllables**:

[sik]+ [stēnth]

Or when you think about the word *sixteenth* as something written, it can be analyzed into three **elements** — that is, written parts that have a consistent spelling and meaning in different words:

six + teen + th

Elements are the shortest parts of written words that add meaning to their word. The elements of a word occur in other written words with a meaning and a spelling that remain consistent. For instance, *six* shows up in *sixty* and *sixes*, *-teen* in *eighteen* and *teenager*, *-th* in *seventh* and *hundredth* — and even in a newer word like *nth*, pronounced [enth], as in “to the nth degree.” We will deal with elements in much more detail later, starting with chapter two.

And the written word *sixteenth* can be analyzed into nine **letters**:

<s>+<i>+<x>+<t>+<e>+<e>+<n>+<t>+<h>

Vowel and Consonant Letters

Sometimes we talk about vowel and consonant letters; sometimes about vowel and consonant sounds. When we are referring to letters, we put them inside corner brackets. Thus, <c> is the letter you can see at the front of the written word *cat*. When

we are referring to sounds, we put them in square brackets. Thus, [k] is the sound you can hear at the front of the spoken word [kat]. In this case the consonant letter <c> spells the consonant sound [k].

When we talk about letters, we refer to them by their alphabet names. <C> is cee; <m> is em, <ch> is cee aitch, and so on. Apparently not all letters' alphabet names have conventionalized spellings. *Webster's Third Unabridged Dictionary* lists the following for the consonants, the letters in parentheses being optional: *be(e), ce(e), de(e), ef(f), ge(e), aitch, jay, ka(y), el, em, en, pe(e), cue, ar, es(s), tee, ve(e), double-u, ex, wy(e), zee*. The five vowel letters <a>, <e>, <i>, <o> and <u> apparently have no regular spelled-out names. (Oddly, *oh* is listed with the meaning "zero," due to the similarity between the numeral 0 "zero" and the letter <o>, but *oh* is not defined as meaning the letter <o> itself.)

When we talk about sounds, we refer to them by the sounds themselves. So [k] is referred to by the sound you hear at the beginning of [kat], though when most people refer to [k] in isolation, they end up saying something that sounds more like "kuh."

We distinguish between vowel and consonant letters in a way perhaps different from the way you are used to. We distinguish three groups: (i) those four letters that are always vowels: <a>, <e>, <i>, and <o>, (ii) those three letters that are sometimes vowels, sometimes consonants: <y>, <u>, and <w>, and (iii) those letters that are always consonants: the other nineteen.

The letter <y> is a consonant when it spells the sound it spells in *yes*, but when it spells any other sound, it is a vowel, as in *gyp, type, and many*. The basic pattern underlying the vowel and consonant uses of <y> is that <y> is a consonant at the beginning of a word, a vowel at the end. In the middle of words it is a consonant only if it is the first letter of a base element and is spelling the first sound of a syllable, as in *beyond, be+yond*.

The letter <u> is a consonant when it spells the sound [w], as in *penguin*; it is also a consonant any time it comes right after <q>, whether it spells [w] or not, as in *queen* and *unique*. But most of the time, <u> is a vowel, whether it is spelling a vowel sound by itself, as in *funny* and *dune* or (as in *should, around, you, and delicious*) as part of a vowel **digraph** or **trigraph** (combinations of two or three letters that spell a single sound).

The letter <w> is a vowel only in the vowel digraphs <aw>, <ew>, and <ow>—as in words like *draw, few, and low*. Everywhere else <w> is a consonant: It is a consonant when it spells the sound it does at the front of *way*. And it is a consonant in the consonant digraphs <wr> and <wh>, as in *write, while, and who*.

The letter <h> could plausibly be treated as a vowel in words like *John, ohm, and dahlia* (and in interjections like *eh, oh, and ah*) where it is clearly involved in the

spelling of the vowel sound. But it seems better not to complicate further what is already a fairly complex analysis since this use of <h> as a vowel is restricted to quasi words like *oh* and *ah* and to a very few other words that either are proper nouns (*John*) or are adopted from proper names (*ohm* from Georg Ohm, a German physicist, and *dahlia* from Anders Dahl, a Swedish botanist). So we treat <h> as always a consonant along with the other eighteen letters.

At first you may find the analysis of vowels and consonants here somewhat odd. Generally, we treat a letter as a vowel when it spells a vowel sound and as a consonant when it spells a consonant sound. It is important to make the distinction as we do because it helps make more rational some of the spelling procedures and rules. For instance, chapter three discusses the procedure of twinning: When we add a suffix that starts with a vowel to a word that ends with a final single consonant letter preceded by a single vowel letter, the final consonant letter must be twinned: *hop*+*p*+*ing* = *hopping*. If we don't recognize that, for instance, <u> and <w> can sometimes be consonants and sometimes vowels, then we have trouble with this twinning rule. For instance, if <w> is treated as always a consonant, then it should be twinned in a word like *clawing*, which, of course, it is not. And if <u> is treated as always a vowel, then a word like *quiz* wouldn't fill the requirements for the twinning rule (since it would have two vowels preceding the final <z>), and the <z> wouldn't be twinned in words like *quizzed*, which, of course, it is.

Perhaps the handiest source for more information about how over the centuries some of our letters have come to serve double duty as both vowels and consonants is the series of entries in the *Oxford English Dictionary (OED)* at each letter. **Exercise 1.1, p. 92**

Speech Sounds

Linguists don't always agree on how many speech sounds there are in English. Agreeing on a number is difficult because, among other things, actual speech consists of an unbroken flow rather than discrete sounds and because pronunciations vary a great deal from person to person and from place to place. In our analysis we recognize thirty-nine sounds – fifteen vowel sounds and twenty-four consonants.

Vowel Sounds. The fifteen vowel sounds include six short vowels and six long vowels:

Table 1.1

Short	Long
[a] as in <i>hat</i>	[ā] as in <i>hate</i>
[e] as in <i>met</i>	[ē] as in <i>meet</i>
[i] as in <i>bit</i>	[ī] as in <i>bite</i>
[o] as in <i>mop</i>	[ō] as in <i>mope</i>

Short	Long
[u] as in <i>but</i>	[ū] as in <i>boot</i>
[ʊ] as in <i>cook</i>	[yū] as in <i>cute</i>

We will sometimes use the sound symbols above to refer to long vowels and sometimes just call them long, so "[ā]" and "long <a>" mean the same thing. The vowel sound in *book*, [u], is sometimes referred to as "high short <u>"; the [u] in *but* is sometimes referred to as "low short <u>", because it is pronounced with the tongue in a lower position in the mouth than is high short <u>: [kut] vs. [kuk], *cut* vs. *cook*. The long [ū] is called "long ooh." The long [yū] is called "long <u>, which sounds like "long you."

The table above simplifies some complexities in the English vowel system. It conflates into one sound, symbolized [o] and called short <o>, as many as three low back sounds. For instance, *American English Spelling* distinguishes between the vowel sounds in *cot* and *caught*. The *American Heritage Dictionary (AHD)* distinguishes three low back sounds, in *cot*, *caught*, and *father*. For our present purposes, we don't need to complicate things with such careful sound distinctions, which can be very difficult to discern, especially in some dialects and idiolects. So we conflate them into the single short <o>, [o].

Exercise 1.2, p. 93

In addition to these twelve long and short vowel sounds, our analysis also recognizes two diphthongs: the [oi] in *coy* and the [ou] in *cow*. A **diphthong** runs together two vowel sounds. In the diphthong [oi] the two sounds are [o] and [i]; in [ou] they are [o] and [u]. (The word *diphthong* combines two Greek elements: *di-*, which means "two," and *phthong*, which means "sound.")

The fifteenth vowel in our analysis is a very common sound much like low short <u>, or [u]. It is the sound you hear at the beginning of the word *alone*, a soft "uh" sound. It is called **schwa** (rhymes with *paw*) and is written with an upside-down <e>: [ə]. Schwa sounds like the low short <u>, [u], except that schwa is weaker. Low short <u> is always stressed, but schwa is always unstressed, so the word *above* [ə.bʊv] contains both schwa and short <u>. (The Merriam-Webster dictionaries use a schwa to symbolize both the schwa sound and stressed short <u>.)

Exercise 1.3, p. 93

Consonant Sounds. Most of the twenty-four consonant sounds are symbolized with letters that are easily associated with their most common spelling. The consonants recognized in our analysis are divided into the following six groups:

(i) The **stops** are formed by closing off, or stopping, the flow of air out of the mouth and then releasing it quickly. Stops are sometimes called plosives, since the air flow is stopped, then exploded out. They come in three pairs in which the two members are identical except that one is **voiceless** and the other is **voiced**. A voiced sound is

pronounced with the vocal cords vibrating, a voiceless sound is pronounced with no vibration:

Table 1.2

Voiceless	Voiced
[p] as in <i>pop</i>	[b] as in <i>bob</i>
[t] as in <i>tat</i>	[d] as in <i>dad</i>
[k] as in <i>kick</i>	[g] as in <i>gig</i>

(ii) The **fricatives** are formed by forcing air through a passage that is constricted enough to cause friction and turbulence. The word *fricative* comes from a Latin word that means “rub.” The nine fricatives come in four voiceless-voiced pairs and one voiceless singleton:

Table 1.3

Voiceless	Voiced
[f] as in <i>fluff</i>	[v] as in <i>verve</i>
[s] as in <i>scarce</i>	[z] as in <i>czars</i>
[θ] as in <i>thin</i>	[ð] as in <i>then</i>
[ʃ] as in <i>shush</i>	[ʒ] as in <i>azure</i>
[h] as in <i>hot</i>	

Sometimes, even if you have trouble hearing the difference between, say, voiceless [θ] and voiced [ð], you can feel the difference. Put your fingers lightly on your throat just up under your chin and say *bath*. You should feel nothing as you pronounce the [θ]. Then say *bathe*. You should feel some vibration in your throat as you pronounce the voiced [ð]. The vibrations are caused by your vocal cords.

(iii) There are just two **affricates**, again a voiceless-voiced pair:

Table 1.4

Voiceless	Voiced
[tʃ] as in <i>church</i>	[dʒ] as in <i>judge</i>

Each affricate is really a combination of two sounds: a stop followed by a fricative: [tʃ] equals [t]+[ʃ], and [dʒ] equals [d]+[ʒ]. The word *affricate* comes from a Latin word that means “rub together.”

(iv) There are three **nasals**, all of which are voiced:

Table 1.5

[m] as in <i>sum</i>	[n] as in <i>sun</i>	[ŋ] as in <i>sung</i>
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The sound [ŋ] is called *eng*. Nasals are formed by allowing air to resonate in the nasal cavity and pass out through the nose.

(v) There are two **liquids**, which are also both voiced:

Table 1.6

[l] as in <i>lull</i>	[r] as in <i>roar</i>
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The sounds [l] and [r] are called *liquids* because they are pronounced smoothly, with no friction.

(vi) There are also two **semivowels**, both voiced:

Table 1.7

[w] as in <i>woo</i>	[y] as in <i>you</i>
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Semivowels can function as consonants but have some of the features of vowel sounds. Notice that the letters <w> and <y>, which regularly spell [w] and [y], are two of the three letters that can function as both vowel and consonant. The third of the three letters, <u>, is a consonant when it spells the semivowel [w]. **Exercise 1.4, p. 94**

In chapter five, “The Sound-to-Spelling Correspondences,” we will look at the various spellings of each of these sounds, but before we can do that, we must examine the elements of words and the procedures and processes involved when those elements combine. Elements, procedures, and processes are the subjects of chapters two through four.

2 Elements: Bases and Affixes

Elements vs. Syllables

Elements are parts of written words that have a consistent spelling and meaning from one word to another. Very often elements are exactly one syllable long – as with *six* and *teen*, so elements and syllables often share the same boundaries. Because many elements are exactly one syllable long and do so often share boundaries in a word, it is tempting to assume that an analysis into elements is the same as an analysis into syllables. But the two analyses are not the same: Syllables are parts of spoken words while elements are parts of written words. And when we analyze a word into syllables, we do not worry about analyzing its meaning. But we do worry about meaning when we analyze a word into its elements.

Not all elements are exactly one syllable long. For instance, an element like *-th* in *sixteenth* does not contain a vowel sound, so it is less than a syllable. So, too, the element *-s* in *cats*. On the other hand, many elements, like *mother*, *father*, *brother*, and *sister*, are more than one syllable long. Exercise 2.1, p. 95

Elements vs. Spellings

Elements are strings of letters that have a consistent meaning or spelling from word to word and that add meaning to the words in which they occur. For instance, the spelling <cook> occurs in such words as *cook*, *cooks*, *cooked*, *cooking*, *overcook*, *undercook*, *precooked*, *cook-off*, *cookbook*. And in all of these words *cook* has a consistent spelling and adds a consistent meaning to the seven words. Also, it cannot be divided into shorter elements that go together to spell and mean what the word *cook* means the way that, say, *cookware* can be divided into the elements *cook* and *ware* that go together to spell and mean what the word *cookware* means.

Of course, the string of letters <cook> can be taken apart in various ways. For instance, it could be taken apart into <co> plus <k> – or into <coo> plus <k>, or even into <c> plus <ook>. And these six spellings all have entries and are defined in *Webster's Third Unabridged Dictionary*:

c: "the 3rd letter of the alphabet"; a common abbreviation
co-: "with, together, joint, jointly, shared, mutually"
coo: "to make the low soft cry of a dove or pigeon"
k: "the 11th letter of the alphabet"; a common abbreviation
ok: "all right, yes"
ook: (Scottish) "week"

Although all six of these spellings can be found in the word *cook*, none of them is an element in it. Although each of the six spellings has a meaning, no combination of these six meanings can go together to mean anything even close to the meaning of the

word *cook*. So to take *cook* apart into any of these six parts would not help us understand it better. It would not be an analysis of the word. Since it cannot be analyzed any further into shorter elements, the word *cook* is a single element. It is both a word and an element – and it is one syllable long.

Exercise 2.2, p. 95

Bases, Free and Bound

There are two different kinds of elements: **bases** and **affixes**. A base is a word's core of meaning. It is the element that can have other elements affixed to it, both in front and in back, so it is where we start when we begin analyzing a word's meaning. There are two kinds of bases: **free** and **bound**. Free bases can stand free and be used as independent words. An example of a free base would be *cook*, for it can and does stand alone as an independent word. Nearly all one-syllable words are also free bases, so are many words with two or more syllables but only one element, such as *mother*, *lettuce*, *mattress*, *picnic*. Examples of one-syllable words that contain more than a free base are *tenth* [tenth] ten+th and *grows* [grōz] grow+s.

Exercise 2.3, p. 96

Not all bases are free. Those that cannot stand alone as independent words are called **bound bases**. Look at these words, for instance:

<i>evoke</i>	= e + voke
<i>invoke</i>	= in + voke
<i>revoke</i>	= re + voke
<i>provoke</i>	= pro + voke

The repeated element *voke* is the base of these four words. This *voke* can combine with other elements to form words, but by itself it cannot stand free as a word. You can evoke something, invoke it, revoke or provoke it, but you can't simply "voke" it. If you were to check for an entry spelled <voke> in your dictionary, there is probably none there. Dictionaries do not list most bound bases.

The preceding sentence says "most" because dictionaries do routinely list those bound bases they usually call **combining forms**. Combining forms can be combined with other elements — bases, suffixes, prefixes, or other combining forms — to make words. Examples are *tele+* and *electr+*. Combining forms are particularly common in the scientific and technical registers. So far I have not found any compelling reason to treat combining forms as anything different from bases, usually bound bases.

It can be hard to see the consistency of meaning an element, especially a bound base, has in different words. Sometimes you can work it out by comparing the definitions of the words that contain the element. For instance, the bound base *domin* occurs in *dominate*, *dominant*, *domineer*, and *condominium*. The definitions of *dominate*, *dominant*, and *domineer* all include the notions of "rule, control." The definition of *condominium* includes the notion of "joint sovereignty, joint control," the prefix *con-*

meaning “together, joint.” In a condominium, the residents own their own homes and thus have sovereignty or control over them. So we can say that the modern base *domin* carries the sense “sovereignty, control.”

Exercise 2.4, p. 96

Elements and Etymology

However, the base of *domino*¹ “a costume with mask and cape” and *domino*² “a tile used in a board game” is historically this same *domin* though here the semantic relationship with “sovereignty, control” is more remote. The changes in meaning of the base in words like *domino*¹ and *domino*² can limit the usefulness of comparing definitions for identifying a suspected base, but we can usually get help in a word's etymology. Look at this entry for the word *provoke* from the *AHD*:

pro-voke (prĕ-vxk') *tr.v.* **pro-vo- ked, pro-vo- k-ing, pro-vo- kes.** **1.** To incite to anger or resentment. **2.** To stir to action or feeling. **3.** To give rise to; *evolve*: *provoke laughter*. **4.** To bring about deliberately; induce: *provoke a fight*. [Middle English *provoken*, from Old French *provoquer*, from Latin *prōvocāre*, to challenge : *prō-*, forth; see *PRO*-¹ + *vocāre*, to call . . .] —**provok'ing-ly** *adv.*

Toward the end of the entry in square brackets you can find the word's **etymology**, which describes the history of the word, working back to its original form in Latin. From the etymology you can see that *provoke* comes from the Latin verb *prōvocāre*, which meant “to call forth.” The meaning “to call forth”, which we find in the etymology of the word, is its etymological meaning.

We can also see that *prōvocāre* was formed from two Latin parts – the first, *prō-*, “forth,” and the second, *vocāre* “to call.” The bound base *voke* comes from that Latin verb, so we can say that the etymological meaning of *voke* is “call.”

There has been some change in meaning over the centuries, but it is not hard to see how the etymological meaning “to call forth” could develop into the current meaning of *provoke*. When you provoke someone to fight, you can be said “to call him forth” or “to call him out,” just like the showdown in a cowboy movie. Nor is it hard to see the etymological meaning “call” in other words that contain the bound base *voke*: *evolve*, *invoke*, *revoke*. For instance, the element *re-* in *revoke* means “back,” and when the authorities revoke one's drivers license, they do in fact call it back.

Voke is the form of the base used at the end of words. In the form *voc* it appears elsewhere in words, as in *advocate*, *vocation*, and *vocal*. Notice that we have the verb *evolve* but the related noun *evolution*.

Different dictionaries locate and organize their etymologies in different ways. You should read the section dealing with etymologies in the introduction to your dictionary to

be sure you understand where to find them and how they are organized. And have your students do the same. You may have to put a little pressure on students to read the introductory material in their dictionaries, important and useful though it may be. Most people never read the front matter in their dictionaries, and many feel it odd to do so.

Exercises 2.5 and 2.6, pp. 97

Elements and Meaning

This discussion speaks of a word or element's "meaning," a way of speaking that is essentially an expedient. For I believe that words and elements don't actually have meanings. They have semantic content, which is an agreed-upon range of senses that people can draw from to formulate and communicate their own meanings. The point is that words and elements don't have meanings, people do. Words and elements have content, a potential for making meanings. I believe this is a very important distinction, but trying to avoid talking about word meaning in a discussion like this one can make the descriptions seem very awkward and abstract. So, using a bit of familiar shorthand, we will speak as if words and elements did have meanings.

We've said that the base *domin* in *dominate* and in *domino*¹ "costume" and *domino*² "game tile" are related historically, but the meanings of the three words are so different, how can we say that there is a consistent meaning uniting them? The set of meanings, or senses, carried by a word is a disjunctive category. That is, it is a category made up of two or more meanings that are connected by *or*. That is the way the definitions of words are presented in dictionaries. Look back at the four definitions of the word *provoke*: The word means "To incite to anger or resentment," **or** "To stir to action or feeling," **or** "To give rise to; evoke," **or** "To bring about deliberately; induce." In any given use the word *provoke* can be used to mean any one of those things.

What we are dealing with here is polysemy, the condition of having more than one meaning. Just about every word in the English language is polysemous, as a look at most any dictionary definition will show. The same is true of elements, even bound elements like *domin*. Polysemy arises because words are used by people to communicate meanings, and since people's meanings constantly change, they stretch words a bit, applying them, for instance, to refer to things or situations slightly different from what the words were used to refer to before, thus expanding the semantic meaning of the word. In time this expansion can lead to new senses being agreed upon and added to the word's content, thus creating polysemy.

As we change and expand words' meanings, we usually follow one of two kinds of relationship: those based on similarity and those based on contiguity. In the first, the new and old referents are taken to be somehow alike or similar. It is easy to see the strands of similarity unifying words like *dominate*, *domineer*, *dominant*, *dominance*, *dominion*, and even *condominium*.

The second kind of relationship is based on contiguity – that is, on contact or association with one another in time, or space, or cause and effect, or part to whole. *Domino*¹ “masked and caped costume” comes from a French word originally used to refer to a black winter robe worn by priests, so called perhaps in a joking reference to the Latin phrase *Benedīcamus Dominō* “Let us praise the Lord.” (The Latin word for lord, *dominus*, meant “master, controller, supreme ruler.”) The priests’ black robes were seen to be contiguous with the phrase *Benedīcamus Dominō*. And in a second jump, the cloaked and masked costumes were seen to be similar (in color) to the priests’ robes.

*Domino*² appears to come from the fact that the back of the domino tile used to be black like the cape of the domino costume (though another suggestion is that the connection may be that the black pips on the white domino tile look a little like the eye holes in the domino mask; etymology is not always a sure science). Thus, the connection between *domino*¹ “masked and caped costume” and *domino*² “game tile” is again one of similarity: some visual similarity, probably again the black color.

The meaning of the base *domin* in *domino*¹ is something like “masked and caped costume,” and its meaning in *domino*² is “game tile.” Thus, if we were to write a dictionary entry for the bound base *domin*, it could go something like “1. sovereignty, control; or 2. ruler, lord; or 3. a costume with cape and mask, usually black; or 4. a black and white game tile.” In spite of the wide difference in meaning among the words that contain the bound base *domin*, we can still say that *domin* has a consistent meaning from word to word because there is a plausible chain of connections uniting the various meanings, connections based on similarity and contiguity.

Affixes: Prefixes and Suffixes

Affixes are bound elements that are added to the front or back of bases. Affixes at the front of bases are prefixes. In the word *repainted paint* is the base, a free base; *re-* is a prefix. Suffixes are bound elements that go at the end of bases, like the *-ed* in *repainted*. There are two kinds of suffixes: inflectional and derivational.

Inflectional Suffixes. The *-ed* in *repainted* is an inflectional suffix. Inflectional suffixes add meanings to the stem that help answer questions like “One or more than one?” “Whose?” “How much?” and “When?” For instance, the inflectional suffix *-ed* adds meanings to verbs that help answer the question “When?”, and the suffix *-s* adds meanings to nouns that help answer the question “One or more than one?” In the sentence “George repainted three of the chairs,” the *-ed* adds the meaning “in the past” to the verb *repaint*; the *-s* adds the meaning “more than one” to the singular noun *chair*. This *-ed* is a past tense inflectional suffix; this *-s* is a noun plural inflectional suffix.

There are two common noun plural suffixes: One is spelled <s>, one <es>. We add the *-es* plural suffix to singular nouns that end with one of four sounds: [s], [z], [ch], or [sh].

For instance, *tax* takes *-es* to form the plural *taxes*. In *tax* the <x> spells the combination sound [ks], so *tax* ends with the sound [s].

The distinction between the use of *-es* and *-s* is a rational and understandable one. The sounds [s], [z], [sh], and [ch] are all hissing, or sibilant, sounds. (Remember that the affricate [ch] is actually a combination of two sounds [t] plus the sibilant fricative [sh].) If we were to add *-s* to singular nouns that end in these sibilant sounds, it would be difficult to distinguish between spoken singular and plural nouns. For instance, the plural of *box* would be <boxs>, [bokss], which would quickly simplify to [boks], making the spoken singular and plural forms indistinguishable. The plural of *guess* would be <guesss>, which would violate a constraint in English against triplet letters, and the spoken singular and plural forms would again be indistinguishable. So *-es*, pronounced [iz], is used in place of *-s*, making the distinction between the spoken singulars and plurals quite clear: [boks] vs. [bok-siz] and [ges] vs. [ges-iz].

The noun plural suffix *-es* is also used in two other places. First, in singular nouns that end in a <y> preceded by a consonant, when the plural suffix is added, the <y> changes to <i> and the *-es* form is used: For instance, the plural of *city* is *cities*: *city* + i + *es*. Remember the old ditty, "Change the <y> to <i> and add <es>."

Second, singular nouns that end with an <o> preceded by a consonant vary between *-s* and *-es*. Most of them take the regular form, *-s*: *pianos*, *altos*, *twos*, *egos*. Many take either *-s* or *-es*: *banjos*, *banjoes*; *zeros*, *zeroes*; *mottos*, *mottoes*; *innuendos*, *innuendoes*. With either of these kinds of words it's always safe to use *-s*.

But a few nouns that end with <o> preceded by a consonant take only *-es*, the most common being *echo*, *embargo*, *go*, *hero*, *Negro*, *potato*, *tomato*, and *veto*. With these eight the plural should be formed with *-es*. (When *hero* is used in the compound *hero sandwich*, its plural is often spelled *heros*.)

Exercise 2.7 and 2.8, pp. 98-99

The most common noun inflectional suffix is the plural suffix, sometimes spelled *-es* but usually just *-s*. The other noun inflectional suffix helps answer the question "Whose?" In the sentence "She is George's daughter" the *'s* adds the meaning "possession" to the noun *George*. This possessive noun suffix is usually spelled <'s>, but when you form the possessive of plural nouns that are spelled with *-s* or *-es*, you spell the possessive suffix with a plain apostrophe: "his three daughters' names" and "the two new taxes' impact."

We also add inflectional suffixes to verbs. Nearly all verbs change their form to distinguish between action in the past and action that is not in the past. For instance, if we change the time talked about in a sentence like "He enjoys dancing" by adding *yesterday* to it, we must change the form of *enjoys* to show that we are now talking about action in the past: "He enjoyed dancing yesterday." We use the inflectional suffix *-ed* to help answer the question "When?" by adding the meaning "in the past."

The sentence “He enjoys dancing” illustrates the limitations of thinking of verbs as action words: *Dancing* appears to be much more of an action word than does *enjoys*, but still *enjoys* is the verb while *dancing* functions as a noun, the direct object of the verb. Nouns like *dancing* are **gerunds**, nouns that were derived from the present participle, or *-ing*, form of verbs.

In most cases we use just four different inflectional suffixes with verbs. The suffix *-ed*, as we've seen, adds the meaning "in the past," as in the difference between *enjoyed* and *enjoys*. The verb suffix *-s* is more complex. Look at this set of present tense verbs:

	Singular	Plural
1st Person	I sing	We sing.
2nd Person	You sing	You sing.
3rd Person	He sings She sings It sings	They sing

The *-s* in *sings* adds the complex meaning "3rd person, singular, present tense." This suffix is spelled *-es* with verbs that end with the sounds [s], [z], [sh], and [ch] and in some verbs that end in <o>, and after a <y> preceded by a consonant that has changed to <i> — just like the noun plural suffix *-es*, as in “She misses her dog and wishes he would come home” and “The wind-up toy whizzes and goes pop!” and “He flies to Alaska every summer.”

The verb suffix *-ing* and another one spelled *-ed* help describe an action as either not completed or completed: "The meat is cooking" means that the meat is not yet done; its cooking is not completed. But "The meat is cooked" means that the meat is done; its cooking is completed. So in phrases like "is cooking" and "will be cooking" the *-ing* (which is the present participle suffix) means "going on and not completed," while in phrases like "is cooked" and "will be cooked" the *-ed* (the past participle suffix) means "completed." The word *participle* originally had the now obsolete sense “A person, animal, or thing that partakes of the nature of two or more different classes” (*OED*). Participles are called participles because they partake of the nature of both verb and adjective or noun.

Two last inflectional suffixes (*-er* and *-est*) are used with some modifying words – short adjectives and some adverbs – to add the meaning "more" and "most", as in the series *calm*, *calmer*, *calmest* and *fast*, *faster*, *fastest*.

Exercise 2.9, p. 99

Derivational Suffixes. Inflectional suffixes add layers of meaning to their words. But some suffixes change the entire function of the words to which they are affixed — that

is, change their part of speech. These suffixes add meanings like "This is an adjective" or "This is an adverb" and are called derivational suffixes.

In "She sang that lyric with a style that was truly lyrical" the derivational suffix *-al* in *lyrical* changes the noun *lyric* into an adjective. In "She gave him a calm look and then answered him very, very calmly" the suffix *-ly* in *calmly* changes the adjective *calm* into an adverb. In "That fellow on the bench is the coach's assistant" the *-ant* changes the verb *assist* into a noun.

Three Derivational Suffixes		
calm	+ ly	= <i>calmly</i>
(an adjective)		(an adverb)
lyric	+ al	= lyrical
(a noun)		(an adjective)
assist	+ ant	= <i>assistant</i>
(a verb)		(a noun)

Exercises 2.10 and 2.11, p. 100

A Different Kind of Derivational Suffix. Derivational suffixes usually change a word's part of speech. That is, they change it so that it can be used in a different way. The noun *lyric* can be used in certain ways, the adjective *lyrical* in others, the adverb *lyrically* in still others. But some derivational suffixes change a word just enough to allow us to use it in different ways though not enough to change its part of speech.

For instance, some derivational suffixes change one kind of noun into a different kind of noun: *Gang* is noun that refers to a certain kind of group of people. *Gangster* (that is, *gang* plus the suffix *-ster*) is also a noun, but it refers to an individual who belongs to such a group. *Trick* is a noun; *trickster* is a noun that refers to a person who enjoys playing tricks. Notice that *-ster* can also be added to adjective stems to create nouns, as in *youngster* and *oldster*.

Exercise 2.12, p. 101

Stems

From now on we will be looking at what happens when elements are added to or subtracted from the front or the back of other elements. Sometimes we will be dealing with single bases. Sometimes we will be dealing with bases that have one or two prefixes in front of them, sometimes with bases that have one or two suffixes behind them, sometimes with bases that have prefixes in front and suffixes behind. It would be helpful to be able to refer to all of these combinations with one short word.

There already is such a word: *stem*. A stem is any element or string of elements to which we are going to add or from which we are going to subtract other elements. Every stem must contain at least one base, but it can have any number of prefixes or suffixes, including no prefixes or suffixes at all. Stems, like bases, can be either bound or free.

So all of the following combinations are stems—in this case, free stems:

Combinations	Example Stems
Free Base	paint
Prefix + Free Base	repaint
Free Base + Suffix	painted
Prefix + Free Base + Suffix	repainted

And we can go on adding elements, especially prefixes and suffixes, as in free stems like *unrepainted*, which has two prefixes.

Stems can also contain bound bases, as in the following examples, with the bound base *spect*::

Combinations	Example Stems
Prefix + Bound Base	respect
Prefix + Bound Base + Suffix	respectful
Prefix + Prefix + Bound Base + Suffix	disrespectful
Prefix + Prefix + Bound Base + Suffix + Suffix	disrespectfully

Stems can also be bound, as in stems like *spect*, *spectful* and *spectfully*, none of which is a word. Sometimes even a stem with a free base can be bound. For instance, In the word *unblinkingly*, *unblinking* is a free stem because it's also a word, but *unblink* is bound, since we do not have the word *unblink*. Remember the word *stem* because we will be using it often.

Compound Words

We can add a prefix to the beginning of a stem: re + paint = *repaint*. Then we can add a suffix to the end of that stem: repaint + ed = *repainted*. And we can go on, adding a prefix to that stem: un + repainted = *unrepainted*. But we can also add free stems to the front or back of free stems to make **compound words**. A **compound word** is a word

that contains two or more free stems. For instance, we can add the free stem *paint* to the free stem *brush* to form the compound word *paintbrush*. Some similar examples:

<i>sunrise</i>	=	sun + rise
<i>homework</i>	=	home + work
<i>congressman</i>	=	congress+man
<i>paperback</i>	=	paper + back

Exercise 2.13, p. 102

Setting Bound Elements Free

Sometimes a bound element is used as if it were free, and such uses sometimes become standard, and what was once a bound element is set free. For instance, the word *stereo* started out as a bound stem in the phrase *stereophonic sound system*. That name was too long to be handy, so it was clipped to *stereo*, thus setting a bound element free. A similar thing happened with *automobile*: The bound stem *auto* was set free and became a word. For our purposes we can say that when an element or stem that was once bound is commonly used as a word – like *stereo* or *auto* – we can call it a free stem.

Exercise 2.14, p. 103

A Note on Syllables

So far we have spoken of syllables without defining them, other than saying that they are parts of spoken words that contain one and only one vowel sound – or, as we will see below, a vowel-like sound produced by a syllabic consonant like that spelled <m> in *rhythm*. Though we will not speak much more about syllables, it may be well to pause to say a bit more about them – if only to explain why we use them so little in *Spelling for Learning*.

Though it is usually treated rather casually, as if it were simple and obvious, the concept of syllables actually poses some serious difficulties, primarily with explaining where to draw the boundaries between them. For instance, should a word like *generate* be [jen-ər-āt] or [je-nər-āt] or [je-nə-rāt] or [jen-ə-rāt]? Or, assuming that the person doing the syllabication doesn't know a phonetic alphabet and uses the regular alphabet: *gen|er|ate*, *ge|ner|ate*, *ge|ne|rate*, *gen|e|rate*? There is no problem hearing how many syllables there are in the word, but there are complex problems deciding where the dividing lines are to be drawn. Notice that all four syllabifications of *generate* above consist of three syllables. Syllables are usually easy to count because each always contains one and only one vowel or vowel-like sound. Syllables can be hard to demarcate because each may or may not contain consonants before and after the vowel, and it is not always entirely clear with which vowel a given consonant belongs. Thus the floating [n] and [r] (or <n> and <r>) in the different possible syllabifications of *generate*.

Boundaries are often defined in terms of open and closed syllables: Open syllables end in a vowel sound; closed syllables end in a consonant sound. The general

principles are that stressed short vowel sounds will occur in closed syllables while stressed long vowels and diphthongs will occur in open syllables and that unstressed short vowels and reduced vowels like schwa will occur in open syllables if there is only one consonant sound between the unstressed short vowel and the next vowel sound. These principles are applied only to initial and medial syllables; long vowels can occur in closed final syllables: *decide* [di-sɪd], *control* [kən-trɒl], etc.

These principles work quite well, assuming that the students are clear on the distinctions among stressed and unstressed short and long vowels. These distinctions can get especially confusing if the student is using the regular spelling alphabet to represent syllables: *co|mmu|ni|ty*. The <o> is unstressed with only a single consonant sound, [m], between it and the next vowel sound, so it is in an open syllable. Notice, though, that although there is a single consonant sound following it, [m], there are two consonant letters, <mm>. That kind of thing can be confusing. The <i> is also unstressed with a single consonant sound between it and the next vowel, so it is also open. The <u> is long and therefore its syllable is open, but that <i> feels stressed enough to tempt *co|mmu|nit|y* rather than the preferred *co|mmu|ni|ty*, or [kə-myū-ni-tē]. There is the stuff of real confusion here.

Further, the sound [r] after unstressed vowels is not covered by the two principles: *International*, for instance, is [in-tər-nash-ə-nəl], not the implausible *[in-tə-rnash-ə-nəl], and the noun-adjective *separate* is [sep-ər-it], not *[sep-ə-rit].

There also can be uncertainties if there are three consonant sounds between two vowel sounds: *transparent* is [trans-par-ənt] in dictionaries, but from a purely phonological point of view it is hard to see why [tran-spar-ənt] would not be just as plausible. The preferred syllabication appears to be motivated at least in part by the desire to keep the syllables and elements coterminous: The prefix is *trans-* not <tran>, and the base is *pare*, not <spare>. (But, going back to the first pages of this chapter, notice that the preferred syllabication of *sixteenth*, [sɪk-stēnth], does not agree with the analysis into elements, *six+teen+th*: In the syllabication the [s] moves from the first to the second element, and the boundary between the second and third elements is obliterated.)

This uncertainty can also arise in certain cases of close consonant clusters, like <st>: *instant* is [in-stənt], not [ins-tənt], again at least in part due to the analysis into elements: *in+stant*. Compare that with the preferred syllabication of *pestilence*: [pes-tələns] rather than [pest-ə-ləns], which comes closer to matching the analysis into elements.

A further difficulty grows out of the distinction between spoken syllables (with which we have so far been dealing) and written syllables. Dictionaries usually divide main entry words into written syllables – that is, they divide the word at places where it can be hyphenated and run on at the end of a line. Written syllables are based essentially on sound, but sound as it is modified by the desire to avoid ending lines with odd-looking or potentially misleading word parts. Thus, a dictionary's analysis of a word into written syllables may not agree with its analysis into spoken syllables in its phonetic respelling

for showing its pronunciation. For instance, the written syllables in *loutish* are <lout>+<ish>, maintaining the integrity of the elements, the base *lout* and the suffix *-ish*. But its spoken syllables are [lou-tish], following the principles discussed above, even though doing so violates the integrity of the base and suffix. Similarly, the analysis of *sixteenth* into spoken syllables, [sik-stēnth], does not agree with its analysis into written syllables: <six>+<teenth>.

Further complications are raised by a word like *rhythm*, which has two syllables, [rith-m], although it has only one vowel letter, the <y>. The reason for this is that when it follows a consonant and comes at the end of a word, the letter <m> sometimes functions as if it were a vowel. Other instances are in *chasm*, *algorithm*, *organism* – and all the other words with the suffix *-ism*. A consonant like the <m> in *rhythm* that constitutes a syllable on its own is called a *syllabic consonant*. Other letters that can spell syllabic consonant sounds are <n>, <l>, and <r>. Notice that in *button*, *brittle*, and *butter*, you do not hear any vowel sounds in the final syllables, just the consonant sounds [n], [l], and [r]. A syllable always contains one and only one peak of sound. In the huge majority of cases those peaks are vowel sounds spelled by vowel letters, but occasionally the nasals and liquids [m], [n], [l], and [r] can provide the peak without a vowel letter, nearly always at the end of free stems.

So before students can be expected to analyze words reliably into syllables, they need to know a great deal: the distinction between written and spoken syllables, the distinction between vowel and consonant letters, the contrast between long and short vowel sounds, the difference between consonant sounds and consonant letters, the contrast between stressed and unstressed vowels. They also must be able to handle the complexities posed by having one set of principles for syllables that come at the beginning and in the middle of words as opposed to those at the end. And they must be able to handle the added complexities posed by [r], by tight consonant clusters like [st], and by syllabic consonants. This is no small set of demands.

Because of these complexities our discussion will use the concept of syllables only sparingly, as, for instance, in the discussion of the v.v string in words like *lion* and *create* in which two vowel letters are separated by a syllable boundary. In general, my advice would be to use the concept of syllables as little as possible and as quickly as possible to wean students away from it and into the more useful analysis of words into elements.

Exercise 2.15, p. 103

This chapter has looked at the elements that combine to form written English words. The next chapter will look at procedures and rules that govern how those elements combine and thus how those words are spelled.

3 Simple Addition and the Three Changes

Chapter two discussed the analysis of words into their elements. Chapter three will discuss how to combine elements into words. Combining elements into words is controlled by certain procedures. When you can write clear and reliable directions for a spelling procedure, you have one kind of spelling rule.

Simple Addition

Usually when elements combine into words, they go together without any changes in the spelling of the individual elements:

repainted	=	re + paint + ed
adjectives	=	ad + ject + ive + s
bookkeeping	=	book + keep + ing

This is the most common procedure in English spelling. In fact, the first and most powerful spelling rule is that usually you don't make any changes when you combine elements into words. Unless you have a definite reason for changing the spelling of any elements when you combine them, don't make any changes. Just add them together. This first rule of spelling is called the **Rule of Simple Addition**.

The Rule of Simple Addition

Unless you know of a definite reason for making a change, simply add the elements together.

In all of the words that combine via the Rule of Simple Addition, the spelling of the word is the sum of the spelling of its elements. If you can spell those little short elements, you can spell the word – no matter how long it may be. That is one reason why compound words like *blackbird* and *fireplace* are so easy to spell: Compound words regularly combine through simple addition.

The Three Changes

But things are not always so simple. Often when you combine elements into words, the spelling of one or more of the elements changes. Earlier we described elements as having a consistent meaning and spelling from one written word to another. We say that a spelling is consistent if, even though it changes slightly from word to word, it follows patterns and rules so that we can predict and understand the changes. There are three kinds of changes that can occur when elements combine into words:

1. an extra letter can be put in, or inserted;
2. a letter can be taken out, or deleted;
3. one letter can be replaced by another – which means that one letter has been deleted, and another has been inserted in its place.

In the following a letter is inserted:		
tap + ing	= tap + p + ing	= tapping
panic + y	= panic + k + y	= panicky
In the following a letter is deleted:		
tape + ing	= tapé + ing	= taping
free + est	= freeé + est	= freest
In the following a letter is replaced:		
ad + pear	= ad + p + pear	= appear
try + ed	= try + i + ed	= tried

Exercise 3.1, pp. 105

The First Change: Insertion

Twinning. A word like *tapping* can be analyzed into the stem *tap* plus the suffix *-ing*, with a <p> inserted between the stem and suffix: *tapping* = tap + p + ing. A word like *taping* can be analyzed into the stem *tape* plus the suffix *-ing*, with the <e> in *tape* deleted: *taping* = tapé + ing. In Table 3.1 the words in the left column are analyzed to show any changes that occurred. Each of the sets of three words contains two different stems, which are listed in the right column. In the Words column the underlined letters are letters that have been inserted. The v's and c's will be explained later:

Table 3.1

Words	Analyses	Stems
CVCCV sham <u>mm</u> ing	sham+m+ing	sham
VCV shaming	shameé+ing	shame
shameful	shame+ful	
CVCCV scrap <u>pp</u> ed	scrap+p+ed	scrap
VCV scrap <u>e</u> ed	scrapeé+ed	scrape
scrapes	scrape+s	

Words	Analyses	Stems
cvccv ridd <u>a</u> nce	rid+d+ance	rid
rids	rid+s	
vcv rid <u>a</u> ble	ridé+able	ride
cvccv bid <u>d</u> er	bid+d+er	bid
cvccv bid <u>d</u> able	bid+d+able	
vcv bid <u>e</u> ing	bide+ing	bide

The analyses in Table 3.1 lead to the following conclusions. If any of them are not evident to you, check them against the table:

1. In the words in which a letter is inserted, the inserted letter is a twin to the final letter of the stem.
2. The stem of each word in which insertion occurs contains one syllable, or one vowel sound.

Now go back to Table 3.1 and look at the underlinings and v's and c's, which demonstrate the following conclusions:

3. Each inserted letter is preceded by the sequence *cvc* (consonant-vowel-consonant), in which the vowel is short, as is the vowel in the stem.
4. The suffix after each inserted letter starts with a vowel.
5. **A First Twinning Rule:** You twin the final consonant of a stem that has one syllable, or vowel sound, and ends with the string *cvc* when you add a suffix that starts with a vowel. Exercise 3.2, p. 107

Two Important Patterns: *vcc* and *vcv*. Now in Table 3.1 examine the words in which a letter is deleted. The words in the table should demonstrate the following conclusions:

6. The *vcv* pattern occurs in all the words in which a letter is deleted, and the first vowel in the *vcv* pattern is always long, as is the vowel in the stem.

7. The vcc pattern occurs in all the words in which twinning occurs, and the vowel in the vcc pattern is always short, as is the vowel in the stem.

The vcv and vcc patterns, which mark long and short vowels respectively, motivate the twinning procedure in English spelling: We twin in order to keep the preceding short vowel "looking" short. Twinning gives us the vcc pattern and avoids the vcv pattern when adding a suffix that starts with a vowel.

VCV

If we didn't twin, we would get sham + ing = *<shaming>, with the long vowel sound, [ā], which is the wrong pronunciation.

VCC

But when we twin, we get sham + m + ing = *shamming*, with the short vowel sound, [a], the correct pronunciation.

Expanding the Twinning Rule. We now have a first twinning rule that is accurate for stems that are one syllable long and that end *cvc*, a string in which the vowel is regularly short. To write a more comprehensive final rule we need to look at a wider variety of words.

As you've seen, the word *vowel* can refer either to a sound or a letter. The stems in Table 3.2 all contain a single vowel sound spelled with more than one vowel letter. Notice what happens (or doesn't happen) when the suffixes are added to the stems to form longer words:

Table 3.2

Stems	Suffixes	Longer Words
dead	-er, -est, -en	deader, deadeat, deaden
cook	-able, -ery, -ed	cookable, cookery, cooked
deaf	-er, -est, -en	deafar, deafeat, deafen
brawl	-ing, -ed, -y	brawling, brawled, brawly
fraud	-ulent	fraudulent
broad	-eat, -en	broadeat, broaden
daub	-er, -y, -ed	daubar, dauby, daubed
blood	-ed, -ing, -y	blooded, blooding, bloody
gawk	-ish, -y	gawkish, gawky
taut	-eat, -en, -er	tauteat, tauten, tauter

Table 3.2 demonstrates that you do not twin the final consonant of a stem that contains a single vowel sound spelled by two vowel letters: It's *deader*, not **<deadder>*.

The stems we've discussed so far have all ended with a single consonant letter that spelled a single consonant sound. All but two of the words in Table 3.3 end in one consonant sound that is spelled with two consonant letters. The other two words end in a combination of two consonant sounds spelled with a single consonant letter:

Table 3.3

Stems	Suffixes	Longer Words
bomb	-ed, -er, -ard	bombed, bomber, bombard
yacht	-ing, -ed	yachting, yachted
fix	-ate, -ity	fixate, fixity
graph	-ic, -ite	graphic, graphite
stick	-er, -y, -ier	sticker, sticky, stickier
talk	-ative, -y	talkative, talky
rock	-iest, -er, -y	rockiest, rocker, rocky
fox	-ed, -ing, -y	foxed, foxing, foxy
myth	-ical, -icize	mythical, mythicize
rich	-er, -est, -en	richer, richest, richen
flash	-ed, -ing, -y	flashed, flashing, flashy

Table 3.3 demonstrates the following:

1. The single consonant letter that spells a combination of two consonant sounds is <x>, which spells [ks] at the end of words. (Notice that both [k] and [s] are voiceless sounds; in some words, especially when it is surrounded by voiced vowels, <x> spells the corresponding voiced consonant combination [gz]: *exist*, *examine*, *auxiliary*.)
2. When adding a suffix that starts with a vowel, you do not twin consonants that consist of two letters or two sounds. (You might try twinning some of these — and see what funny-looking spellings you get: **<bombmbing>*, **<richcher>*, **<yachtchting>*.)
3. **A Revised Twinning Rule:** You twin the final consonant of the stem when you add a suffix that starts with a vowel to a stem that has just one vowel sound and that ends in a single vowel sound and letter followed by a single consonant sound and letter.

Primary Word Stress. In words with two or more syllables some vowel sounds are usually louder than others. For instance, in *alone* the second vowel sound, [ō], is louder than the first, [ə]. In *bacon* the situation is reversed: The first vowel sound [ā], is louder than the second, [ə]. These different degrees of loudness are word stress. The loudest sounded vowel in a word is said to bear primary stress. When it is significant, we will print vowels with primary stress in large boldface: *al**o**ne* and *ba**a**con*.

Each word below contains two vowel sounds. In each one the vowel with primary stress is in large boldface. Read each word aloud, being sure you hear the stress difference. If you find it hard to hear primary stress, here is a hint that may help: Exaggerate the difference in stress between the vowel sounds. For instance, in a word like *lovely*, pronounce the first vowel sound very loud and the second very soft: "LOVE-ly!" Then try it with the first syllable very soft and the second very loud: "love-LY!" You should find that one version sounds less grotesque than the other. The less grotesque version is the one with the proper stress pattern.

Table 3.4

ba r ren	fo r eign	comp e l	ali v e
achi e ve	hop i ng	re a lly	lei s ure
exce e d	desce n t	de e cent	re g ion
fi r ery	conce i ve	wri t ten	relie v e
equi p	li k ely	dec i de	exi s t

And remember: The pronunciation your dictionary gives of your word includes the proper stress pattern.

Some words in English have one stress pattern when they are used as nouns and another when they are used as verbs. The following sentences contain examples. Pronounce each pair of sentences, listening carefully to the stress differences in the pairs of words printed in italics:

Table 3.5

- 1a. Doris and Bob's oldest son is a real *rebel*.
- 1b. He will *rebel* against most anything.

- 2a. There has been an *increase* in crime lately.
- 2b. Do you think it will *increase* even more?

- 3a. He used to be a *convict*.
- 3b. When did they *convict* him?

- 4a. That farm grows a lot of *pr**o**duce*.
 4b. What do they *pr**o**duce* besides cabbage?
- 5a. This present is an *in**s**ult*!
 5b. Why did he *in**s**ult* her so?
- 6a. When did they *pr**e**sent* you with the gold watch?
 6b. That *pr**e**sent* is an insult!

Table 3.5 demonstrates that in such noun-verb pairs, primary stress falls on the first vowel sound of the noun but on the final vowel sound of the verb. In general, English prefers the strong stress close to the front of the word, which explains the strong stress at the front of noun stems. But English also likes to alternate quite regularly between weaker and stronger stress. Since verbs often have weakly stressed suffixes like *-ing*, *-ed*, and *-es* added to them, it makes sense to have the stress on the final syllable of the verb, to avoid having two consecutive weak syllables— which explains the strong stress at the end of verbs stems. (It is the tendency to alternate fairly regularly between weaker and stronger stress that makes the iambic meter so natural to English poetry.)

In Table 3.6 all of the words in the Stems column end with a single consonant letter that is spelling a single consonant sound and is preceded by a single vowel letter. All the stems contain two vowel sounds, or syllables. The derived and inflected words are formed by adding suffixes to the stems. Vowels with primary stress in each word are in large boldface, and inserted twin consonants are underlined. Pronounce all the words in the table carefully, listening for primary stress:

Table 3.6

Stems	Derived and Inflected Words		
de fer	de fer <u>red</u>	de fer ence	de fer ment
be gin	be gin <u>ning</u>	be gin <u>ner</u>	be gin s
con tr ol	con tr ol <u>led</u>	con tr ol <u>ling</u>	con tr ol <u>ler</u>
com mit	com mit <u>ted</u>	com mit <u>tee</u>	com mit ment
fi n al	fi n ality	fi n alist	fi n ally
li mit	li mit ed	li mit ation	li mit less

Table 3.6 demonstrates that in stems with two vowel sounds, you twin the final consonant only when there is stress on the final vowel sound of the stem both before and after you add the suffix.

In Table 3.6 one-third of the stems have stress on the first vowel, two-thirds on the final vowel. That distribution is not typical of English. Like nouns, two-syllable adjectives and adverbs tend to have strong stress on the first vowel,—as do many two-syllable prepositions, like *after* and *under*— so stress falls on the first vowel of most two-syllable English words.

Exercise 3.3, pp. 108

Secondary Stress. So far we've spoken in terms of only two levels of word stress: primary and weak. Most dictionaries show three levels of stress: primary, secondary, and weak. Primary is the heaviest; weak is the lightest, and secondary is the one in the middle. We will not mark vowels with weak stress, but we will print vowels with secondary stress in normal size bold.

Each word in Table 3.7, whether it contains two vowel sounds or three, contains just one primary stress. Most contain a secondary stress. Notice that as the position of primary and secondary stress shifts in words, there is often a shift in meaning, just as the meanings shifted in words like *rebel* and *rebe*l in the sentences in Table 3.5. For instance, **overflow** is a verb, but **overflow** is a noun.

Table 3.7

Stems	Derived and Inflected Forms		
circular	circularity	circularize	circularly
overlap (vb.)	overlapped	overlapping	overlaps
overrun (vb.)	overrunner	overrunning	overruns
humbug	humbugged	humbuggery	humbugging
inherit	inherited	inheritance	inheriting
liberal	liberalism	liberality	liberalness

Table 3.7 demonstrates the following:

1. In stems in which twinning occurs, the final vowel sound has either secondary or primary stress both before and after you add the suffix.
2. **The Final Twinning Rule:** You twin the final consonant of a stem if you are adding a suffix that starts with a vowel, and if the stem ends in a single vowel sound and letter followed by a single consonant sound and letter, and if there is at least secondary stress on the final vowel sound of the stem both before and after you add the suffix.

We assume that monosyllabic stems have primary stress.

Exercise 3.4, p. 109

Twinning and Variant Spellings. Many words in English can be spelled correctly more than one way. Donald Emery's *Variant Spellings in Modern American Dictionaries* (NCTE, 1973) presents a list of more than 2,500 words that each have at least one variant spelling. Many of these sets of variants contain one spelling with twinning, one without.

Table 3.8 presents pairs of variant spellings, both of which are correct according to at least some dictionaries. The spelling that better fits the Twinning Rule is given in the "Better Fits" column. It stands to reason that if you have a good rule on one hand and choice of spellings on the other, you might as well choose the spelling that better fits the rule. The reason that variant better fits your Twinning Rule is spelled out in the "Reasons" column:

Table 3.8

Variant Spellings	Better Fits	Reasons
benefited	benefited	The <i> in <i>benefit</i> does not have secondary or primary stress.
benefitted		
busing	bussing	Fits all the criteria of the twinning rule for one-syllable stems.
bussing		
diagramed	diagrammed	Fits all the criteria of the twinning rule for two-syllable stems
diagrammed		
worshiped	worshiped	The <i> in <i>worship</i> does not have secondary or primary stress
worshipped		

If you check the words with variant spellings in the dictionary, you will find that some of the words also have variant pronunciations and stress patterns. So as you are deciding which spelling fits your Twinning Rule, you will also be deciding which pronunciation and stress-patterning you prefer.

Not all dictionaries agree on the acceptability of some variants. Notice that in the two-syllable stems that call for twinning, the final vowel of the stem is short. In those that do not, the final vowel tends to be reduced down to a schwa or a sound somewhere between schwa and short <i>. Twinning in stems with unstressed final syllables, as in *traveller* and *cancelled*, is more characteristic of British English spelling. In American English we tend to require at least secondary stress on the final syllable of the stem.

The injunction to choose the variant spelling that fits the rule is an example of *the Principle of Preferred Regularity*: "Faced with variants, a speller's most sensible approach would seem to be to choose the most regular. . . . By adhering to this

principle, we assist the spelling system in its systemic evolution toward greater regularity and simplicity” (AES, p. 25).

Exercise 3.5, p. 109

Other Cases of Insertion. There are two other important cases in which letters are inserted between elements: <k> insertion and the insertion of <i> or <o> as linking particles.

<k> Insertion. When suffixes that start with <e>, <i>, or <y> are added to stems that end with <c>, a <k> is regularly inserted:

Table 3.9

Words	Analyses
bivouacked	bivouac+k+ed
colicky	colic+k+y
panicked	panic+k+ed
picnicker	picnic+k+er
trafficking	traffic+k+ing

The motivation here is straightforward: A stem-final <c> is always hard. If suffixes that start with <e>, <i>, or <y> were added by simple addition, the <c> would be soft: *<colicy>, *<paniced>, *<picnicer>, *<trafficing>. The <k> is inserted to insulate the <c> from the <e>, <i>, or <y>, thus keeping it hard. Notice that in cases where the stem-final <c> shifts from hard to soft with the addition of a suffix, the <k> insertion does not occur: mystic+ism = *mysticism* not *<mystickism>, and critic+ize = *criticize* not *<critickize>.

Linking Particles. Words that come from Greek often have a linking <o> between bases: *biology*, bi+o+log+y; *democracy*, dem+o+cracy; *geography*, ge+o+graph+y; *philosophy*, phil+o+soph+y. This Greek linking <o> usually carries primary stress. Words from Latin often have a linking <i>: *agriculture*, agr+i+cult+ure; *centipede*, cent+i+pede; *homicide*, hom+i+cide; omnivorous, omn+i+vore+ous; *sacrifice*, sacr+i+fice. The motivation here appears to be to break up consonant clusters that could complicate pronunciation or obscure the boundaries between bases.

The Second Change: Deletion

Silent Final <e>. The second type of change when elements combine involves the deletion of a letter. The letter that is most often deleted is the silent final <e> of the stem. To understand the procedure for deleting silent final <e>, we must first discuss its various functions.

Silent Final <e> as a Vowel Marker. In a stem one syllable long silent final <e> will often mark a preceding vowel as long.

The vce# Pattern. A silent final <e> regularly will mark the vowel in front of it as long if there is only one consonant letter between them:

Table 3.10

Short Vowel Sounds		Long Vowel Sounds	
[a]	cap	[ā]	cape
[e]	met	[ē]	mete
[i]	gyp, fin	[ī]	type, fine
[o]	not	[ō]	note
[u]	dud	[ū]	dude

Exercise 3.6, p. 110

Normally, a silent final <e> will not mark a long vowel if there are two or more consonants between it and the vowel: *fence, dense, lapse, bronze, matte, grille, edge*. However, there are three groups of words that complicate the picture:

Words Ending <aste> and <ange>. Table 3.11 demonstrates that in words that end in <aste> and <ange> the silent final <e> will regularly mark the preceding vowel as long even though there are two consonants between the vowel and the <e>.

Table 3.11

Words with a Short Vowel	Words with a Long Vowel	
hast	haste	waste
past	paste	taste
chang	change	grange
rang	range	strange

(*Webster's Third Unabridged* has three entries for *chang*: (1) (Brit. dial.) a loud noise, uproar; (2) a Tibetan beer; (3) (usu. cap.) a Naga people of the India-Burma frontier.)

There are two notable holdouts to this conclusion: *flange* and *caste*, both of which have short rather than long vowels. *Flange*, which is a form of an earlier word *flanch*, did not appear in our language until the 19th century. Apparently the need to mark the soft <g> was more pressing than the expectation of a long vowel before <nge>. *Caste* was usually spelled <cast> until the 19th century, when it was respelled in line with the French spelling. It is not clear why the respelling occurred, though there may be a clue

in the fact that *caste* and *chaste* are etymologically related. In spite of these holdouts, words ending <aste> and <ange> will regularly have long <a>.

The *vccl*e vs. *vcle* Contrast. Look at and pronounce the words in Table 3.12:

Table 3.12

Words with a Short First Vowel		Words with a Long First Vowel	
addle	pebble	noble	staple
apple	goggle	ladle	cable
castle	gentle	stifle	able
rubble	cobble	ruble	ogle
whistle	startle	stable	idle
rifle		rifle	quadruple

Table 3.12 demonstrates that in words that end <le> the silent final <e> regularly will mark the preceding vowel as long if there is only one consonant between the vowel and the <le> but not if there are two consonants.

We can summarize what we have concluded so far concerning silent final <e> as a marker of long vowels:

In words that end <le> a silent final <e> will mark a preceding vowel long if there is only one consonant between the vowel and the <le> and will mark a long <a> in words ending <aste> and <ange>, but normally it will only mark a vowel long if no more than one consonant comes between the vowel and the <e>.

In the following we use the # sign to mark the end of the stem. These long vowel patterns – *vc*e# and *vc*le# – are very widespread and powerful patterns in English spelling. *vc*e# is one of the first patterns youngsters learn when they start learning to read. It is a special case of the wider *v*cv, vowel-consonant-vowel, pattern discussed earlier.

Final <e> after Unstressed Vowels. Silent final <e> only marks a long vowel if that vowel has either primary or secondary stress. It does not mark as long a vowel with weak stress. Pronounce the following sentences carefully and notice the sound and stress pattern of the italicized words:

Table 3.13

- 1(a) She wore an *elaborate* headdress.
- 1(b) He would not *elaborate* on his earlier comment to the press.

- 2(a) They had a very *intimate* conversation.
 2(b) She did not *intimate* what they discussed.
- 3(a) They roasted the duck in a *moderate* oven.
 3(b) The committee asked the group to *moderate* its demands.

All of the italicized words in the six sentences contain the derivational suffix *-ate*, which forms verbs and adjectives. In the three (a) sentences the italicized words are used as adjectives; in the (b) sentences, as verbs. As the words are used differently, the stress shifts, and thus the pronunciation of *-ate* changes: In the verbs, the stress (as usual with verbs) is on the final vowel sound, so the silent final <e> marks a long <a>. But in the adjectives the unstressed <a> is pronounced like a short <i>.

The cases where *-ate* is pronounced [it] can be explained by stress-shifting. In the adjective forms the vowel in *-ate* is weakly stressed. And the silent final <e> only marks a long vowel if that vowel has either primary or secondary stress, as it always does in the verbs with the suffix *-ate*. The letter <a> in a weakly stressed syllable often spells [i], especially in the suffixes *-ate*, *-age*, and *-ace*, as in words like *adequate*, *manage*, and *furnace*. Notice that several of the adjectives that end *-ate* can also be used as nouns: *moderate* and *intimate*, for instance. Other similar adjective-nouns are *confederate*, *fortunate*, *literate*, *predicate*, *private*, and *separate*, all with no stress on the final vowel and with *-ate* pronounced [it].

There are a number of verbs, adjectives, nouns, and adjective-nouns that end with the suffix *-ite* and that show the same pattern of stress-shifting and vowel marking as do words with *-ate* — for instance, *expedite*, *excite*, *incite*, *definite*, *perquisite*, *favorite*. Again, the verbs have stress on the final, and thus long, vowel sound, while the adjectives and nouns do not.

Exercise 3.7, p. 110

The ve# Pattern. Silent final <e> also marks a stressed vowel immediately in front of it as long: *agree*, *free*, *tie*, *pie*, *oboe*, *mistletoe*, *argue*, *barbecue*, *dye*, *rye*. In some cases these spellings feel more like vowel digraphs than single-letter spellings plus a diacritic final <e>, but we will treat them as the latter and thus as instances of the ve# pattern: a single vowel letter followed by a silent final <e>.

In words ending with a weakly stressed ve#, the vowel is still usually long: *algae*, *sundae*, *coulee*, *coffee*, *Yankee*, *collie*, *genie*, *movie*.

Exercise 3.8, p. 110

Silent Final <e> as a Consonant Marker. Sometimes silent final <e> does not affect the preceding vowel but does affect the preceding consonant – namely, the sounds spelled by <c>, <g>, and <th>. The consonant letter <c> spells the sound [s] when it is followed by the vowel letters <e>, <i>, or <y>: *chancing*, *chancy*, *chance*; *mysticism*, *choice*, *farce*. A <c> that spells [s] before <e>, <i>, or <y> is called *soft <c>*. The consonant letter <c> spells the sound [k] everywhere else, including the end of the word: *career*, *discuss*, *nucleus*, *critic*, *arc*. A <c> that spells [k] is called *hard <c>*.

In Old English – that is, English as it was spoken and written from roughly the 5th through the 12th centuries – <c> regularly spelled [k], except when it was followed by <e>, <i>, or <y>, in which case it spelled [ch]. But after the Norman Conquest during the Middle English period – from roughly the 11th to the end of the 15th centuries – the Norman French scribes used <c> to spell the French sound [ts] before <e>, <i>, or <y> and to spell [k] elsewhere. In time the [ts] eased to [s]. So, although the value of what we now call soft <c> has changed, our distinction between hard and soft <c> comes from both the Germanic side of the language family tree (via Old English) and the Romance side (via Norman French).

This distinction arose from the influence of the vowel following the <c> upon the pronunciation of the consonant sound spelled by the <c>. You can experience some of the pressure leading to the distinction if you compare the way you pronounce the [k] sounds in *kit* and in *cot*: In *kit* you should feel the [k] being pronounced further forward in your mouth, in *cot* further back. The difference arises because while pronouncing the [k], your mouth gets itself set to pronounce the upcoming vowel: In *kit* that vowel is [i], which is pronounced toward the front of your mouth, so your tongue moves forward while pronouncing [k]. In *cot* the vowel [o] is pronounced towards the back of your mouth, so your tongue moves back while pronouncing the [k]. Over the centuries this modest difference in pronunciation of the [k] increased to our current distinction between hard and soft <c>.

The letter <g> can also be soft or hard, depending on the letter that follows it. Usually, the letter <g> spells the sound [j] when it is followed by the vowels <i>, <y>, or <e>, including silent final <e>: *gin*, *gyp*, *general*, *lounge*, *siege*. When <g> spells [j], it is soft <g>. Otherwise, <g> spells [g] — as in *gun*, *gap*, *fig* — and is hard <g>.

The distinction between hard and soft <g> is a perfect historical parallel to that between hard and soft <c>: It arose from the influence of the following vowel on the pronunciation of the consonant sound being spelled by the <g>. Front vowels, usually spelled <e>, <i>, or <y>, tended to urge the pronunciation of the preceding consonant more towards the front of the mouth, so that [g] developed into [j].

This explanation is particularly true of words that came to English from or through Latin and French – for example, *gelatin*, *gender*, *general*, *giant*, *gigantic*, *ginger*, *gymnasium*, *gypsum*; *besiege*, *gauge*, *oblige*, *refuge*. In native English words – for example, *geese*, *gild*, *girdle* – and in words from other Germanic languages – such as *get*, *geyser*, *gift*, *gill*, *girth*, *stagger*, *trigger* – hard <g> is common before <e>, <i>, or <y>. The soft <g>, [j], by and large echoes developments in late Latin, when the consonant spelled <g> came to be pronounced [j] before front vowels, which were usually spelled with <e>, <i>, or <y>. However, the only known instances of hard <g> before silent final <e> are *renege* (which is also spelled *renig*) and the rare Irish word *pishoge* “charm, witchcraft,” which has the more regular variant spelling *pishogue*. Exercise 3.9. p. 111

The spelling <th> is also affected by a following silent final <e>. The spelling <th> is a digraph, two letters working together to spell a single sound and behaving in many ways

like a single letter. Notice, for instance, that in the contrast between *bath* and *bathe*, the final <e> marks the long <a> just as if <th> were a single letter. But you should also hear a difference in the sounds <th> spells in *bath* and *bathe*. The difference is the same as the difference between the <th> in *thin* and the <th> in *then*. The [th] in *thin* and *bath* is voiceless. The [th] in *then* and *bathe* is voiced. Remember that in voiced sounds the vocal cords vibrate; in voiceless sounds they do not. A silent final <e> will mark a preceding <th> as voiced, pronounced [th]: *bath* vs. *bathe*, *cloth* vs. *clothe*, *teeth* vs. *teethe*, *loath* vs. *loathe*, *breath* vs. *breathe*.

Exercise 3.10, p. 113

Silent Final <e> as an Insulator. Silent final <e> serves other purposes than marking the sounds of preceding vowels and consonants. Sometimes it is used to keep certain letters from coming at the end of the word.

Word Final <s>. For instance, sometimes it is used to keep a word from ending with a base-final single <s>: In *tens* $ten+s$ the <s> is the plural suffix -s; in *tense* $tense$ the <s> is part of the base, and the silent final <e> is used to keep it from looking like the plural noun *tens*. Sometimes words ending in <s> have a final consonant sound different from words ending in <se> – for instance, *tens* is [tɛnz] while *tense* is [tɛns]. But the difference in sound is not always there, and it is not due to the silent final <e>. *Laps* and *lapse*, for instance, both end with a [s] sound. In words like *tense* and *lapse* the final <e> is simply insulating the <s>.

If the <s> has a short vowel right in front of it, another <s> will be added rather than a silent final <e>: *mass*, *mess*, *miss*, *moss*, *muss*. Notice that if we were to add a final <e> instead of a second <s>, we would end up with a vcv pattern, which would make it look as if the preceding vowel were long rather than short: *<mase>, *<mese>, *<mise>, *<mose>, *<muse>.

So a base that comes at the end of a word and otherwise would end in a single <s> preceded by a consonant or a long vowel will usually have a silent final <e> added, to insulate the single <s> from coming at the end of the word. The same pattern holds for the letter <z>. The letter <z> is fairly rare in English, and the sound [z] is most often spelled <s>. As with <s>, we tend to avoid ending a word with a single <z>. If there is a short vowel preceding the <z>, we add a second <z>, as in *fuzz*, *fizz*, and *jazz*, but if there is a consonant or a long vowel preceding the <z>, we add a silent final <e>, as in *bronze*, *wheeze*, and *booze*.

Word Final <ve> and <ue>. In words that end <ve> – such as *curve*, *give*, *groove*, *have*, *shelve*, and *thieve* – the final <e> does not affect the sound of the preceding <v>. For reasons that go hundreds of years back into the history of our language, we avoid ending words with <v>. Long ago <v> and <u> were actually different forms of the same letter. So the pattern for <v> extends to <u> today as well. We use silent final <e> to insulate an otherwise word-final <v>, and except for a few recent foreign borrowings – like *gnu*, *bayou*, and *tabu* – we also use it to insulate an otherwise word-final <u>, as in *plaque*, *tongue*, *league*, *statuesque*.

Exercise 3.11, p. 113

Fossil Final <e>. The silent final <e>'s that mark or insulate consonants and vowels make up most of the final <e>'s in English – most, but not all. For instance, in words like the following, the final <e> has no function: *cigarette*, *clientele*, *brassiere*, *avalanche*. All of these words were adopted into English from French, with their French spellings. In French, final <e> has some functions quite different from its functions in English. For example, in French final <e> marks feminine words: *Un voisin*, "a neighbor," is masculine, but *une voisine*, "a neighbor," is feminine. Since French does not pronounce most final consonants, the final <e> will often affect the pronunciation. Thus, *absent*, "away," (masculine) is pronounced [op-son] (more or less), with the <t> silent. But *absente*, "away," (feminine) is pronounced [op-son̄t] (again more or less), for since the <t> is no longer word-final, it is pronounced. Many French words adopted into English retain their French spellings even though the final <e> does not retain its French function and very often does not serve any normal English function. These adopted words, with their fossilized final <e>'s might be called words with "French Fossil <e>'s."

Exercises 3.12-3.13, pp. 114-115

A number of words ending in <ine> have fossil final <e>'s in unstressed syllables with short or reduced vowels. Some of these are the fossils of Middle English verb endings (for example, *destine* from Middle English *destinen*); some are the fossils of Latin noun and adjective stems (*doctrine* from the Latin noun *doctrina*; *crystalline* from the Latin adjective *crystallinus*). Others come from various other sources (*engine*, for instance, comes from Middle English *engin* "skill, machine," which comes from Latin *ingenium*, which is also the source of modern *ingenuity*).

Exercise 3.14, p. 115

Old English had a complex system of inflectional suffixes, but in the evolution from Old to Middle English, many of these suffixes reduced down in pronunciation to a neutral schwa sound. This vestige of old inflectional endings came to be spelled <e>. In Middle English (from about the 12th through the 15th century) final <e> was not silent. It was pronounced as a separate weak syllable, [ə], as it is in, say, Chaucer's English. Over the years the final <e> fell silent, though it tended to stay in the spelling. In general, spelling does not change as fast as speech. So we have a number of native English words with silent final <e>'s that were once pronounced. For example, the final <e> in *are* is all that is left of the Middle English verb form *aren*. The final syllable, pronounced [ən], over time lost its [n] to become one of the final <e>'s pronounced [ə]. Other "English Fossil <e>'s" occur in *come*, *done*, *forbade*, *gone*, *none*, *some*.

Silent Final <e> and the Short Word Rule. For centuries there has been a tendency in English spelling to restrict two-letter words – such as *be*, *is*, *to*, and *an* – to a small group of function words. That's one reason we have some otherwise unnecessary final double-consonants – such as in *egg*, *ebb*, *add*, and *err*. Also some silent final <e>'s appear at the ends of words to keep them longer than two letters and thus distinct from words in that select two-letter group: *be*, *bee*; *by*, *bye*; *do*, *doe*; *to*, *toe*; *we*, *wee*.

This usage extends to otherwise two-letter words in general: *dye*, *eye*, *foe*, *pie*, *rye*, *tee*, *vee*, *woe*, *zee*. Notice that stressed word-final vowels are long:

ado	echo	my	so
alibi	fry	nazi	sushi
be	graffiti	no	taxi
bikini	kiwi	patio	to
by	macaroni	rabbi	video
cry	magi	sky	why

So the final <e> in words like *bye*, *tie*, *toe*, and *wee* is motivated solely by the Short Word Rule.

Exercise 3.15, p. 116

In summary, then, silent final <e> can mark long vowels, mark soft <c> and <g>, mark voiced <th>, insulate word-final <u>, <v> and <z> and base-final <s>. It also is sometimes a fossil of earlier patterns and usage with no modern function, and it sometimes fills out an otherwise two-letter word.

Exercise 3.16, p. 116

Deleting the Final <e> that Marks Long Vowels. In order to arrive at a good and reliable rule for deleting final <e>, we'll look one by one at the different kinds of final <e> discussed in the previous sections. You have seen that a silent final <e> regularly marks a preceding vowel as long in words that end *vce#*. You have also worked with the following pattern:

VCC		VCV
shamming	vs.	shaming
VCC		VCV
scrapped	vs.	scraped
VCC		VCV
bidding	vs.	biding

The *vcc* words all have short first vowels; the *vcv* words all have long first vowels. You saw that in words like *shamming* the final consonant of the stem is twinned in order to produce a *vcc* pattern rather than *vcv*, thus keeping the first vowel looking short. In words like *shame*, *scrape*, and *bide* the silent final <e> fills out the *vcv* pattern, making the first vowel look long. When we add a suffix that starts with a vowel to such a word, we can and do delete the final <e> that marks the long vowel because the vowel in the suffix fills out the *vcv* pattern so that the final <e> is no longer needed — thus *shaming*, *scraped*, and *biding*.

Notice that the preceding sentence implies a principle of efficiency or economy in our spelling system: If you don't need something, get rid of it. Although this principle operates unevenly and we still have many evolutionary fossils in our spelling system, still the demand for efficiency does operate.

This principle of efficiency also leads users to generalize the procedure for deleting silent final <e>'s in *vce#* words. The <e> deletion in *vce#* words becomes the prototype for dealing with silent final <e>'s in other words as well, making the procedure more general, powerful, and effective. Thus, we also delete the final <e> in words ending <ange>, <aste>, and *cle#*: $hasté+y = hasty$, $rangé+er = ranger$, $enablé+ed = enabled$.

Deleting Final <e> in Stems that End *ve#*. So far we've discussed final <e> deletion only with stems that have at least one consonant between the final <e> and the preceding long vowel — like *rhymed*, *wasting*, *strangest*, *stified*. Some smaller, local patterns come into play when we add a suffix that starts with a vowel to stems with the *ve#* pattern, in which the head vowel is long. For instance, below are some words whose stems end in the *ve#* pattern <ee> and that are analyzed into their stems and suffixes:

Table 3.14

Words	= Analyses
seeing	= see + ing
foreseeable	= foresee + able
agreeable	= agree + able
agreeing	= agree + ing
refereed	= refereé + ed

With stems that end <ee>, we delete the final <e> only when adding a suffix that starts with <e>. The motivation for the deletion is surely to avoid the <eee> produced by simple addition: $freé+ed$ rather than *<freed>. In English we avoid triplet letters. And the motivation for the simple addition elsewhere is to retain the integrity of the element ending <ee>.

Exercise 3.17, p. 118

We treat stems that end <ie> somewhat differently when we add certain suffixes to them. For instance: $lié + y + ing = lying$. The final <e> is deleted, as the rule says it should be. But if we stopped there, we'd get $lié + ing = *<liing>$. In English we avoid <ii>, so *<liing> is an unacceptable spelling. But we can't just delete one of the <i>'s, because that would lead to *<ling>, which doesn't look at all like the sound of the word it is meant to spell. So we make use of the fact that <i> and <y> are a two-letter team. As you saw earlier, in several words we change a final <y> to <i> when we add a suffix, as in $try + ed = trý+i+ed = tried$. When we want to add <ing> to a word like *lie*, we do just the opposite: We change the <i> to <y> and delete the final <e>: $lié + y + ing = lying$. However, this <i> to <y> change only occurs when the suffix starts with <i>. With other suffixes we just delete the final <e>: $lie + ed = lié + ed = lied$, and $lie + ar = lié + ar = liar$.

Table 3.15

Words	= Analyses
lying	= lié + y + ing
lied	= lié + ed
lies	= lie + s
tied	= tié + ed
tying	= tíé + y + ing

When we add a suffix that starts with the letter <i> to a stem that ends <ie>, we change the <i> to an <y> and delete the <e>. When we add a suffix that starts with any other vowel, we just delete the final <e>.

Exercise 3.18, p. 118

Here are some words with *ve#* stems that end <oe>:

Table 3.16

Words	= Analyses
toed	= toé + ed
hoeing	= hoe + ing
canoeing	= canoe + ing
hoed	= hoé + ed
linalool	= lin + aloé + ol

(The rare *linalool* is a fragrant liquid used in perfumes. It is pronounced [lĩ-nal-ō-ol])

When we add a suffix that starts with a vowel to a stem that ends <oe>, we delete the final <e> unless the suffix starts with the letter <i>. If we deleted the final <e> in word like *toeing*, it would lead to *<toing>, which tends to obscure the boundary between stem and suffix and could be misread to rhyme with *boing* or *sproing*. So the <oe> holdout to the Final <e> Deletion Rule makes sense and is reasonable.

Exercise 3.19, p. 118

The silent final <e> in words that end in <ue> delete that final <e> more simply:

Table 3.17

Words	= Analyses
accrual	= accué + al
rescuer	= rescué + er

Words	= Analyses
barbecuing	= barbecué + ing
gluon	= glué + on
clues	= clue + s

When we add a suffix that starts with a vowel to a stem that ends <ue>, we delete the final <e>.

You may have noticed that Tables 3.14 -17.16 do not contain suffixes that start with all of the vowels. The reason for that is that we have not found any cases of stems ending in, say, <ee> that take suffixes starting with <o> or <u>. But all in all, it seems safe to summarize the situation with *ve#* stems as follows:

With stems that end <ee>, we delete the final <e> only when adding suffixes that start with <e>: *tee*+ed but *tee*+ing. With stems that end <ie>, we delete the final <e> when adding a suffix that starts with any vowel except <i>, in which case we change the <i> to <y> and then delete the <e>: *die*+ed but *die*+y+ing. With stems that end <oe>, we delete the final <e> when adding suffixes that start with any vowel except <i>: *toe*+ed but *toe*+ing. With stems that end <ue>, we delete the final <e> when adding suffixes that start with any vowel.

Since these smaller, local patterns with stems that end *ve#* involve very few words and in order to keep our rule from getting too complex and cumbersome, we can abbreviate the foregoing as in the following revision of our Final <e> Deletion Rule:

Except for some local rules for some stems ending *ve#*, we delete a silent final <e> that marks a long vowel whenever we add a suffix that starts with a vowel.

Deleting the Final <e> that Marks Consonants. This Final <e> Deletion Rule is a good and reliable one for deleting the final <e> that marks long vowels. But, as we've seen, final <e> can do a number of things other than mark long vowels. And some kinds of final <e>'s are deleted in slightly different ways — for instance, the final <e> that marks soft <c> or soft <g>.

Earlier you saw that <c> spells [s], soft <c>, and <g> spells [j], soft <g>, only before the letters <e>, <i>, and <y>, as in *chance*, *chances*, *chancing*, *chancy*, or *bulge*, *bulged*, *bulging*, *bulgy*. In such words the final <e> in the stem is deleted when the suffix is added: *chance*+es, *chance*+ing, *chance*+y; *bulge*+ed, *bulge*+ing, *bulge*+y. The <e> is deleted because it is no longer needed: the <e>, <i>, or <y> in the suffix will mark the soft <c> or <g>. Sometimes, however, the final <e> is not deleted:

Table 3.18

Words	Analyses
bulges	bulge+s
chancewise	chance+wise
knowledgeable	knowledge+able
outrageous	outrage+ous
manageable	manage+able
replaceable	replace+able
interchangeable	interchange+able
peaceful	peace+ful
courageous	courage+ous

In Table 3.18 the final <e> marking a soft <c> or <g> is not deleted when the suffix is added. Notice that none of the suffixes start with <e>, <i>, or <y>, so the final <e> must be retained in order to continue to mark the soft <c> or <g>. We delete a final <e> that marks a soft <c> or <g> only when adding a suffix that starts with <e>, <i>, or <y>.

Exercise 3.20, p. 118

As you found earlier, final <e> also marks the voiced <th>. Look at the words in the table below and their analyses into free stem and suffix:

Table 3.19

Words	Analyses	Words	Analyses
bather	bathé+er	teething	teethé+ing
blithesome	blithe+some	tithable	blithé+able
loathed	loathé+ed	wreathed	wreathé+ed

Notice that in Table 3.19 the final <e> that marks voiced <th> is deleted only before the letters <a>, <e>, and <i>. We can say with some certainty that it would be deleted before any vowel, but we have not found any stems ending in <the> that take suffixes starting with vowels other than <a>, <e>, and <i>.

Exercise 3.21, p. 119

From the foregoing we can conclude that a silent final <e> that marks soft <c> or <g> is deleted before the letters <e>, <i>, and <y>, and one that marks voiced <th> is deleted before any vowel.

Deleting the Final <e> that Insulates. The final <e> that keeps <u> or <v> or single <z> or single <s> in a base from coming at the end of a word deletes like the final <e> that marks long vowels. Look at the words in Table 3.20 and their analyses into free stem plus suffix:

Table 3.20

Words	Analyses	Words	Analyses
breezy	breez e +y	responsive	respons e +ive
brusquely	brusque+ly	reverses	revers e +es
caves	cave+s	sneezed	sneez e +ed
curvaceous	curv e +aceous	sneezeless	sneeze+less
defensible	defens e +ible	sparsely	sparse+ly
freezable	freez e +able	teaser	teas e +er
gauzelike	gauze+like	tension	tens e +ion

Table 3.20 demonstrates that we delete a final <e> that insulates <u>, <v>, <s>, or <z> when we add a suffix that starts with any vowel letter. **Exercise 3.22, p. 119**

Deleting the Fossil Final <e>. There are no surprises in the way the fossil <e> deletes. Look at the words and analyses below:

Table 3.21

Words	Analyses
adventurous	adventur e +ous
avalanched	avalanch e +ed
awesome	awe+some
coming	com e +ing
destiny	destin e +y
femininity	feminin e +ity
fragileness	fragile+ness
hygienic	hygien e +ic
masculinely	masculine+ly
medicinal	medicin e +al

Table 3.21 demonstrates that we delete a fossil final <e> whenever we add a suffix that starts with a vowel.

Exercise 3.23, p. 119

Deleting Other Silent Final <e>'s. Not surprisingly, when adding a suffix that starts with a vowel, the final <e> also deletes in stems ending *ccle#*: *rattle*+ed = *rattled*, *settle*+er = *settler*, *little*+est = *littlest*, *bottle*+ing = *bottling*, *scuttle*+ed = *scuttled*.

Sometimes a silent final <e> can serve two functions at once — marking a long vowel and either insulating or marking another letter, as in Table 3.22. Again there are no surprises in the deletion pattern:

Table 3.22

Words	Analyses	Words	Analyses
basement	base+ment	pacer	pace+er
bather	bathé+er	pavement	pave+ment
bathing	bathé+ing	placement	place+ment
changeable	change+able	plaguing	plagué+ing
closeness	close+ness	priceless	price+less
clothing	clothé+ing	racer	race+er
courageous	courage+ous	rampageous	rampage+ous
diffusible	diffuse+ible	rampages	rampage+s
easement	ease+ment	rangy	rangé+y
engaging	engage+ing	riser	rise+er
forgery	forge+er	rover	rove+er
fusion	fuse+ion	sagely	sage+ly
gracious	grace+ious	slavishly	slave+ish+ly
lacy	lace+y	spacing	space+ing
outrageous	outrage+ous	vaguest	vague+est

A final <e> that is serving two functions at once is deleted just like a final <e> that is serving only one function. Notice that the more local rule that we delete final <e> after soft <c> and <g> only before <e>, <i>, or <y> preempts the more general rule to delete final <e> before a suffix that starts with any vowel. That preemption is a characteristic of rules of any kind: More local, specific rules tend to preempt wider, more general ones.

The Silent Final <e> Deletion Rule. You delete a silent final <e> that is marking a soft <c> or <g> whenever you add a suffix that starts with <e>, <i>, or <y>; and except for some local cases involving stems ending <ee>, <ie> and <oe>, you delete any other silent final <e> when you add a suffix that starts with any vowel letter.

This rule is a very solid and good one, though there are a few minor complications that we did not go into. This version of the final <e> deletion rule is reliable in the huge majority of cases.

Exercises 3.24-25, p. 120

Some Other Minor Deletions. There are a two cases where letters other than silent final <e> are deleted, more or less systematically: (i) the deletion of penultimate <e>, and (ii) deletion to avoid certain letter sequences.

Penultimate <e> Deletion. *Penultimate* means simply “next to last.” Compare the noun *cylinder* with its adjective form *cylindrical*, which analyzes to *cylindér+ic+al*. The deletion of penultimate <e> is an instance of the tendency of unstressed vowels to disappear, thus reducing the number of syllables in the word. Penultimate <e> deletion is most common before the sounds [r], [l], or [n] when those sounds are followed by a vc sequence at the head of a derivational suffix. Thus, the deleted <e> in *cylindrical* comes before the stem-final [r], which in turn comes before the vc sequence in the derivational suffix *-ic*. Unfortunately, penultimate <e> deletion does not occur before every case of [r], [l], or [n] preceding a derivational suffix that starts with vc – for instance, *furtherance* not *<furthrance>, *deliberate* not *<delibrate>, etc. However, it does occur in enough common words to be worth mention as a minor, localized procedure. Other examples:

carpentry	entrance	lightning	neutral
central	entry	lustrous	registrar
dextrous	fibrous	metrical	registry
disastrous	geometry	ministry	remembrance
encumbrance	laundry	monstrous	spectral

Deletions to Avoid Certain Letter Sequences. English tends to avoid certain letter sequences. A few deletions occur to avoid <ii>: *genie*, *gení+ie*; *carditis*, *cardí+itis*. *Shrilly*, *shrill+ly*; *fully*, *full+ly* delete the <l> to avoid the triplet *<lll>. There is also a weak constraint against doublets inside of longer consonant strings. For instance, it is *eighth*, *eight+th* rather than *<eightth>. Other examples of this constraint at work: *dis+perse*, *dis+stant*, *dis+stinct*, *dis+stress*, *dis+strict*; *trans+scend*, *trans+scribe*, *trans+sistor*, *trans+spire*.

The Third Change: Replacement

Changing <y> to <i>. Earlier you saw that when we add a suffix like *-ing* to a word like *lie*, we delete the silent final <e> and change the <i> to <y>: *lié + y + ing*. But in many more words we do just the opposite, changing a <y> to <i>. For instance, the plural noun *stories* can be divided into the singular noun *story* plus the suffix *-es*. But if we just add those two elements together, we get a wrong spelling: *story + es = <storyes>*. Instead, we replace the <y> with an <i>: *story + i + es = stories*. So far as noun plurals and third personal singular present tense verbs are concerned, the old mnemonic holds: “Change the <y> to <i> and add <es>.” Though, as we shall see below, not all stem-final <y>'s are replaced, <y>'s are regularly replaced with <i> before suffixes other than *-es*:

Table 3.23

Words	= Analyses
marriage	= marry + i + age
supplied	= supply + i + ed
boyish	= boy + ish
crier	= cry + i + er
saying	= say + ing
buyer	= buy + er
hobbies	= hobby + i + es
attorneys	= attorney + s

Table 3.23 demonstrates that we replace <y> with <i> only if the <y> is preceded by a consonant; we do not make the replacement if the <y> is preceded by a vowel. Also, as was said earlier, compound words regularly form via simple addition, which is true of compounds in which the first stem ends with a <y>: *story + teller = storyteller*, *country + wide = countrywide*, *cry + baby = crybaby*, *try + out = tryout*.

If the suffix begins with an <i>, the <y> is not replaced, and the word is formed via simple addition. Thus *try + ing* is not **try+i+ing = <triing>*, since English avoids <ii>. And it is not **try+ing*, which would produce *<tring>*, which can not spell the spoken word [trī - in]. Other examples are *hobbyist* and *cronyism*.

Exercise 3.26, p. 121

One Other Tactical Pattern: v.v

Earlier in this chapter we discussed four tactical patterns: *vcc* and *cvc#*, in which the head vowel is regularly short, and *vcv* and *ve#* in which the head vowel is regularly long.

Another important tactical string is a v.v string of two vowel letters separated by a syllable boundary. In the v.v string the first vowel is always long, even if it is relatively lightly stressed: *lion, create, chaos, bias, giant, poet, trio*.

4 Processes: Assimilation, Palatalization, Shortening

In chapter three we discussed procedures, ruly ways that things are done. In this chapter we discuss processes, which are changes in pronunciation and sometimes spelling that occurred long ago and have complicated modern English spelling. The three processes we will discuss are (i) the assimilation of the final consonant of certain prefixes when they are affixed to stems that start with certain sounds and letters; (ii) the palatalization of certain consonant sounds, which means the pushing back in the mouth of the point of articulation, thus changing the pronunciation and complicating the sound-to-spelling correspondences, and (iii) the shortening of vowels at the head of certain *vcv* strings from the expected long vowel regular to those strings, as in *general*, *lemon*, *sanity*.

Assimilation

English borrowed dozens of Latin words containing the prefix *com-*, which means (in general) "with, together, jointly." But because of changes in pronunciation and spelling, it is sometimes hard to hear the *com-* prefix in the spoken word, or to see it in the written word. Very often *com-* does combine with a stem through simple addition, with no changes taking place at all. Thus, for instance, *com* + *pound* = *compound*. But usually there are changes: Sometimes the <m> in *com-* is deleted: *com* + *erce* = *coerce*. And often the <m> is replaced with an <n>: *com* + *n* + *demn* = *condemn*.

These changes in spelling reflect earlier changes in pronunciation. People tend to make pronunciation as easy as possible. Notice what a mouthful we would have if the <m> and [m] did not delete and we ended up with *<comgnizant> rather than *cognizant*, *com*+*gn*+*izé*+*ant*. By the same token, although *<comdemn> can be pronounced, getting from the [m] sound to the [d] is a bit hard. It is much easier if we replace the [m] with an [n], as in *condemn*, for the tongue is in the same position for both the [n] and the [d]. Since the tongue is in much different positions for [m] and [d] but in about the same position for [n] and [d], from an articulatory point of view [n] is more like [d] than [m] is.

Linguists have a name for the way a sound changes so as to be more like a sound close to it. They call it *assimilation*. The base *simil* in *assimilation* is also in the word *similar*. It means "like." Assimilation causes the [m] in *com-* to become an [n] in words like *condemn*. And sometimes this change in pronunciation is reflected in a change in spelling — as, once again, in *condemn*.

Actually, the change of [m] for [n] is only a partial assimilation. A full assimilation occurs when a sound changes so as to be exactly like another. This happens quite often. For instance, the word *collide* contains a full assimilation of the prefix *com-*: *com* + *l* + *lide*. Also *corrode* contains a full assimilation: *com* + *r* + *rode*. In these two cases we hear only a single [l] sound in *collide*, a single [r] sound in *corrode*. The sounds merge into one, but we still keep the two letters, to help us identify the elements that

form the word. It is because of full assimilation that there are double consonants toward the front of many words.

Sometimes, in order to ease pronunciation, a sound will simply drop out. That is what happens to the [m] in *com-* in words like *coerce* and *cognizant*. The [m] is deleted in the pronunciation and the <m> is deleted in the spelling.

Assimilation, then, is the process by which, in pronunciation, one sound is changed to make it more similar to another, and, in spelling, one letter is either deleted or replaced to reflect the change in pronunciation.

The Prefix *Com-*. The following table illustrates the things that happen when *com-* is added to stems beginning with different letters. The third column indicates the first letter of the stem to which *com-* is being added. The final four columns indicate the process that occurs when the prefix and stem combine, as shown in the Analyses column.

Table 4.1

Words	Analyses	Before	Simple Addition	Assimilation		<m> Deletion
				Full	Partial	
coagulate	com+agulate	<a>				x
combat	com+bat		x			
concord	com+n+cord	<c>			x	
conduct	com+n+duct	<d>			x	
coerce	com+erce	<e>				x
confident	com+n++fident	<f>			x	
incongruous	in+com+n+gruous	<g>			x	
incoherent	in+com+herent	<h>				x
coincide	com+in+cide	<i>				x
conjugal	com+n+jugal	<j>			x	
collection	com+l+lection	<l>		x		
commit	com+mit	<m>	x			
misconnect	mis+com+n+nect	<n>		x		
cooperate	com+operate	<o>				x
compel	com+pel	<p>	x			

Words	Analyses	Before	Simple Addition	Assimilation		<m> Deletion
				Full	Partial	
conquer	com+n+quer	<q>			x	
correction	com+r+rection	<r>		x		
conscience	com+n+science	<s>			x	
contemptible	com+n+temptible	<t>			x	
inconvenient	in+com+n+venient	<v>			x	

The prefix *com-* and stems that start with and <p> combine by simple addition because these stems begin with [b] or [p], two sounds that are already very similar to the [m] at the end of *com-*. The bilabials [p], [b], and [m] are all pronounced at the two lips (*bi-* “two,” *labi+* “lip”). You can feel your lips come together as you pronounce each sound. Assimilation usually occurs to ease pronunciation by bringing two sounds closer together in terms of the place in the mouth where they are pronounced, their point of articulation. In words like *combat*, *compel*, and *compound* the points of articulation are already the same so there is no pressure to assimilate.

As we saw earlier with *condemn*, the partial assimilation of *com-* to *con-* eases pronunciation by moving the points of articulation closer together. While the [m] at the end of *com-* is pronounced out at the two lips, the sounds spelled by the letters <c>, <d>, <f>, <g>, <j>, <q>, <s>, <t>, and <v> are all pronounced in places in the mouth closer to where the alveolar [n] is articulated.

The deletion of [m] and <m> before stems that start with vowels eases pronunciation by removing the consonant sound entirely, creating an easy transition from the vowel <o> in *co-* to the vowel at the head of the stem. The full assimilation before <l> and <r> also eases pronunciation by removing a consonant sound.

To summarize: The prefix *com-* affixes by simple addition before the bilabial sounds [b], [m], and [p]. It affixes by full assimilation to the liquids and nasal [l], [r], and [n]. It affixes by <m> deletion before [h] and the vowels. It affixes by partial assimilation, becoming *con-*, everywhere else.

Notice that when the <m> in *com-* deletes, you get *co-*, a very common and still-productive prefix. *Still-productive* means that we still make up new words with *co-*. And these words do not follow the description you wrote for *com-*. *Co-* is always *co-*, pronounced [kō]: *cobelligerent*, *coconscious*, *codefendant*, *colingual*, *corecreation*. The words in English that follow the assimilation patterns in Table 4-1 are old: They were words long before they came to English. The assimilations took place back in Roman times. Words we make now often do not follow the old patterns of assimilation. Words with the prefix *co-* that don't seem to follow the normal patterns are relatively new words, coined in the last few centuries.

Exercise 4.1, p. 122

The Prefix Ad-. Another common prefix with an interesting pattern of assimilation is *ad-*, which like *com-* we borrowed from the Latin, and which means "to, toward." Sometimes it simply adds to its stem by simple addition: *ad* + *just* = *adjust*. But often there are changes: Sometimes the <d> is deleted: *achieve* = *ad* + *chieve*. And very often the [d] assimilates fully so that the letter <d> is replaced by a letter identical to the first consonant letter in the stem: *affect* = *ad* + *f* + *fect*. Actually the word *assimilation* contains an example of itself: *ad* + *s* + *similation*.

Table 4.2 illustrates what happens when *ad-* is affixed to stems starting with different letters:

Table 4.2

Words	Analyses	Before	Simple Addition	Full Assimilation	<d> Deletion
adaptable	ad+aptable	<a>	x		
abetted	ad+betted				x
unacceptable	un+ad+c+ceptable	<c>		x	
achieved	ad+chieved	<ch>			x
address	ad+dress	<d>	x		
adeptly	ad+eptly	<e>	x		
unaffected	un+ad+f+fected	<f>		x	
aggression	ad+g+gression	<g>		x	
adhere	ad+here	<h>	x		
adit	ad+it	<i>	x		
adjustment	ad+justment	<j>	x		
allowance	ad+l+lowance	<l>		x	
admiringly	ad+miringly	<m>	x		
announcer	ad+n+nouncer	<n>		x	
adolescent	ad+olescent	<o>	x		
disappear	dis+ad+p+pear	<p>		x	
acquittal	ad+c+quittal	<q>		x	
arrange	ad+r+range	<r>		x	
assimilated	ad+s+similated	<s>		x	

Words	Analyses	Before	Simple Addition	Full Assimilation	<d> Deletion
ascending	ad+scending	<sc>			x
aspersion	ad+spersion	<sp>			x
astringent	ad+stringent	<st>			x
attendance	ad+t+tendance	<t>		x	
adult	ad+ult	<u>	x		
adverb	ad+verb	<v>	x		
awaiting	ad+waiting	<w>			x

In *achieved* <ch> rather than <c> goes into the "Before" column because <ch> is a consonant digraph that functions as a single letter, spelling [ch], which we treat as a single sound. In *acquittal* the replacement of <d> with <c> is full assimilation since both the <c> and the <q> spell the sound [k]. One can legitimately say that <cq> is the equivalent of double <q> just as <ck> is the equivalent of double <k> and <dg> of double <j>. The <d> deletions in *ascending*, *aspersion*, and *astringent* are due to the weak constraint in English against clusters of three or more consonants that contain a doublet: The normal assimilations would lead to the clusters *<ssc>, *<ssp>, and *<sst>, all of which are constrained against.

The <d> in *ad-* remains <d> before vowels, <h>, <d>, <j>, <m>, and <v>. It is deleted before , <ch>, <gn>, <sc>, <sp>, <st>, and <w>. It becomes <c> before <q>. It assimilates fully everywhere else. The assimilation pattern for *ad-* is hard to summarize much beyond these four statements, and unless you have a remarkable memory, it is probably not worthwhile to try to memorize all those special cases. But knowing the general pattern can help. It helps, too, to try to get some good, short example words in your mind, so you know the general patterns to watch for. Knowing the general pattern can also help you anticipate some potential trouble spots. For instance, words where *ad-* is added by simple addition should normally not pose any special problems since you usually can hear the [d] sound. The only problems would arise if the stem starts either with <d> or <j>:

Watch for <dd> words formed by adding *ad-* to stems starting with a <d>:

address addition addict

Watch for the <dj> in words formed by adding *ad-* to stems starting with <j>:

adjective adjudge adjourn

Usually cases where the <d> deletes should not be real problems. There is no [d] sound to cause confusion. And trying to assimilate the <d> would lead to some double consonants that don't occur in English and ought to look strange: *<awwait>, *<aggnomen>, or *<asstringent>, and so on.

Stems that start with could pose some problems. For instance, there is no particular reason why *abettled* could not be spelled *<abbetted>, unless it is to avoid confusion with another fairly common prefix, *ab-*. And the word *abbreviate* is a little unusual. Some dictionaries say that it has the prefix *ad-*, some say it has the prefix *ab-*, and some stand squarely in the middle, giving you a choice. The much respected *Oxford English Dictionary* mentions both, but seems to give the nod to *ab-*, so that is what we will settle on here. If you chose *ad-* for *abbreviate*, you would have to explain that pesky replacement of <d> with . But if you choose *ab-*, it is simple addition. Choosing *ab-*, then, fits the Rule of Preferred Regularity, which says that given a choice between two options, one which fits a pattern and one which does not, choose the one that fits the pattern. That is, prefer the one that is more regular.

The other real problem with *ad-* is the change of <d> to <c> before <q> in words like *acquittal*, *acquaint*, *acquiesce*, *acquire*, and *acquisition*. Remember, first of all, that it is a full assimilation and that the <c> there is pronounced [k]. Since in English <q> has to be followed by <u>, we cannot double <q> in a word, so *<acquittal> wouldn't do. The other choice would be *<aququittal>, a genuine mouthful. So the <c> makes sense.

Exercise 4.2, p. 122

The Prefix Ex- The prefix *ex-* has a rather intricate pattern of assimilation, as the following table demonstrates:

Table 4.3

Words	Analyses	Descriptions
exaggerate	ex+aggerate	Simple Addition
ebullient	e x +bullient	<x> is deleted
exceed	ex+ceed	Simple Addition
inescapable	in+e x +s+capable	<x> is replaced with <s>
excavate	ex+cavate	Simple Addition
exchange	ex+change	Simple Addition
edict	e x +dict	<x> is deleted
exercise	ex+ercise	Simple Addition
ineffectual	in+e x +f+fectual	<x> is replaced with <f>, or Full Assimilation
egress	e x +gress	<x> is deleted

Words	Analyses	Descriptions
exhaustion	ex+haustion	Simple Addition
exited	ex+ited	Simple Addition
ejection	e x +jection	<x> is deleted
reelect	re+e x +lected	<x> is deleted
emerge	e x +merge	<x> is deleted
enormously	e x +normously	<x> is deleted
exodus	ex+odus	Simple Addition
expose	ex+pose	Simple Addition
exquisite	ex+quisite	Simple Addition
eraser	e x +raser	<x> is deleted
exsanguinate	ex+sanguinate	Simple Addition
excind	ex+scind	Simple Addition
extipulate	ex+stipulate	Simple Addition
external	ex+ternal	Simple Addition
exude	ex+ude	Simple Addition
evaporation	e x +vaporation	<x> is deleted

In a very few words that contain stems that start with <c> or <ch> and that have been influenced by French, the [ks] spelled <x> simplifies to [s] spelled <s>, as in *escape* e~~x~~+s+cape, *escort* e~~x~~+s+cort, and *eschew* e~~x~~+s+cheat, but most of the time <x> remains <x> spelling [ks] before <c> or <ch>.

We can summarize the data in Table 4.3 as follows: The prefix *ex-* affixes via <x> deletion with stems that start with the voiced consonants , <d>, <g>, <j>, <l>, <m>, <n>, <r>, or <v>. It affixes via full assimilation before <f>. Sometimes it affixes via the partial assimilation of [ks] to [s] and of <x> to <s> before <c> and <ch>, though usually it affixes there via simple addition. It also affixes via simple addition before vowels and the voiceless consonants <h>, <p>, <q>, <s>, and <t>. Or putting it more concisely: The <x> in *ex-* assimilates fully before <f>, and it sometimes becomes <s> before <c> and <ch>; it is deleted before voiced consonants, and it remains <x> everywhere else.

Since the <x> is deleted before voiced consonants, it leaves a single consonant letter, the first consonant in the stem, where other prefixes would have two consonant letters, usually a double consonant. For instance, in the word *egress* e~~x~~ + gress the <x> has

been deleted and there is a single <g>, but in *aggress* *ad* + *g* + *gress*, the <d> in *ad-* has assimilated fully to a <g> so that there is the doublet <gg> and in *congress* the <m> has assimilated partially to <n>, giving <n-g>. By the same token we get *elapse* with a single <l> *ex* + *lapse* but *collapse* with a double <ll> *com* + *l* + *lapse*, and *erect* but *correct*, *emotion* but *commotion*. Later with the prefix *in-*, you'll see the same contrast: *eminence* *ex* + *minence* but *imminence* *in* + *m* + *minence*, and *emigrate* but *immigrate*. Just remember that at the border between *ex-* and a stem, if you can't hear the [ks] or [gz] sounds spelled by the <x> (and *except*, of course, for stems that start with <f>, as in *effect* and *efficient*) there will be a single consonant. Exercise 4.3, p. 123

The Prefix Sub- The prefix *sub-* can combine with any consonant or vowel by simple addition — but then it can also undergo some changes:

Table 4.4

Words	Analyses	Descriptions
subatomic	sub+atomic	Simple Addition
subbasement	sub+basement	Simple Addition
susceptible	sub+s+ceptible	 is replaced by <s>, or Partial Assimilation
subconscious	sub+conscious	Simple Addition
succeed	sub+c+ceed	 is replaced by <c>, or Partial Assimilation
subdue	sub+due	Simple Addition
subequatorial	sub+equatorial	Simple Addition
subfamily	sub+family	Simple Addition
suffering	sub+f+fering	 is replaced by <f>, or Full Assimilation
subgroup	sub+group	Simple Addition
suggest	sub+g+gest	 is replaced by <g>, or Full Assimilation
subhuman	sub+human	Simple Addition
subirrigation	sub+irrigation	Simple Addition
subjunctive	sub+junctive	Simple Addition
subkingdom	sub+kingdom	Simple Addition
sublime	sub+lime	Simple Addition

Words	Analyses	Descriptions
submission	sub+mission	Simple Addition
summon	sub+m+mon	 is replaced by <m>, or Full Assimilation
subnormal	sub+normal	Simple Addition
subordinate	sub+ordinate	Simple Addition
subpoena	sub+poena	Simple Addition
supply	sub+p+ply	 is replaced by <p>, or Full Assimilation
subregion	sub+region	Simple Addition
surrogate	sub+r+rogate	 is replaced by <r>, or Full Assimilation
subsequent	sub+sequent	Simple Addition
subscription	sub+scription	Simple Addition
suspect	sub+spect	 is deleted
substance	sub+stance	Simple Addition
sustain	sub+s+tain	 is replaced by <s>, or Partial assimilation
subtract	sub+tract	Simple Addition
suburban	sub+urban	Simple Addition
subvert	sub+vert	Simple Addition
subway	sub+way	Simple Addition

The prefix *sub-* can combine by simple addition to a stem beginning with any letter, but it sometimes assimilates fully before <c>, <f>, <g>, <m>, <p>, or <r>. The assimilates partially to <s> in *sustain* and *susceptible*, and is sometimes deleted before <sp>. In spite of its apparent complexity, the prefix *sub-* shouldn't cause spellers any great difficulty — though the following cases are worth noticing: In a word like *subplot* you can hear both the [b] and the [p], but in *subpoena* you can hear only the [p].

Also watch for the cases where the has assimilated to <c>: *succeed*, *succinct*, *succor*, *succumb*. Remember that before <e>, <i>, and <y> the letter <c> is pronounced [s], but elsewhere it is [k]. So <cc> will spell [ks] in front of <e>, <i>, or <y>, which is easy enough. But in other cases the <cc> will spell [k], which could cause spellers to

forget to double the <c>. And finally, watch that shift from to <s> in *susceptible*, because the <sc> is pronounced just plain [s]. Even this change makes sense when you think about it: If the assimilated to the <c>, you'd get *<succceptible>, with a [ks], which is the wrong pronunciation. Just as <cq> in words like *acquittal* is a kind of double <q>, <sc> is a double soft <c>. So <c> has four double forms, with four different pronunciations:

Double forms of <c> and their pronunciations	
1.	<ck> = [k]
2.	<sc> = [s] before <e>, <i>, and <y>
3.	<cc> = [ks] before <e>, <i>, and <y>
4.	<cc> = [k] everywhere else

Exercise 4.4, p. 124

Other Prefixes that Assimilate. There are seven other English prefixes that assimilate in various ways. We'll speak briefly of just four of them — *syn-*, *dis-*, and the two prefixes spelled <in>. (The other three are *ab-*, *ob-*, and *en-*, a French form of *in-*. For more on these three prefixes, see *AES*, pp. 196-97, 195-96, and 187-88 respectively. Also, most dictionaries give the assimilated forms in the entry for a prefix.)

Syn- *Syn-* is a Greek suffix, most common in technical words and meaning "with, together." Its assimilation pattern is a bit like that for *com-*:

Table 4.5

Words	Analyses	Descriptions
synapse	syn+apse	Simple Addition
symbol	syn+m+bol	<n> is replaced with <m>, or Partial Assimilation
synchronize	syn+chronize	Simple Addition
syndicate	syn+dicate	Simple Addition
synergy	syn+ergy	Simple Addition
syngamy	syn+gamy	Simple Addition
syllable	syn+l+lable	<n> is replaced with <l>, or Full Assimilation
symmetry	syn+m+metry	<n> is replaced with <m>, or Full Assimilation
synonym	syn+onym	Simple Addition

Words	Analyses	Descriptions
symptom	syn+m+ptom	<n> is replaced with <m>, or Partial Assimilation
symphony	syn+m+phony	<n> is replaced with <m>, or Partial Assimilation
system	syn+stem	<n> is deleted
synsepalous	syn+sepalous	Simple Addition
syntax	syn+tax	Simple Addition
synthesis	syn+thesis	Simple Addition
syzygy	syn+zygy	<n> is deleted

Table 4.5 demonstrates that the <n> in *syn-* assimilates fully before <l> and <m>, and it assimilates partially to <m> before the labial sounds spelled , <p>, <ph>. The bilabial sounds [b] and [p] are pronounced out at the two lips; <ph> spells [f], which is a labial-dental sound, pronounced by bringing the upper teeth against the lower lip. *Syn-* assimilates partially by deleting the <n> sometimes before <s> and before <z>; it affixes via simple addition elsewhere.

Exercise 4.5, p. 124

In-^{1,2}. There are two suffixes spelled <in>. *In*⁻¹ means "no, not," as in *invisible*. *In*⁻² means "in," as in *inhabit*. They have the same assimilation pattern, a pattern even more like that for *com-* than was the pattern for *syn-*.

Table 4.6

Words with <i>in</i> ⁻¹ , "not"	Analyses	Words with <i>in</i> ⁻² , "in"	Analyses
inarticulate	in+articulate	inaugurate	in+augurate
imbecile	in+m+becile	inbred	in+bred
incapable	in+capable	imbibe	in+m+bibe
indecent	in+decent	inception	in+ception
inequitable	in+equitable	induction	in+duction
infamous	in+famous	inference	in+ference
inglorious	in+glorious	ingredient	in+gredient
inhospitable	in+hospitable	inherent	in+herent
injudicious	in+judicious	initial	in+itial

Words with <i>in</i> ⁻¹ , “not”	Analyses	Words with <i>in</i> ⁻² , “in”	Analyses
illogical	in+l+logical	inject	in+ject
immortal	in+m+mortal	illumination	in+l+lumination
innocent	in+n+nocent	imminent	in+m+minent
inoperable	in+operable	innate	in+nate
implausible	in+m+plausible	inoculate	in+oculate
inquietude	in+quietude	implication	in+m+plication
irrelevant	in+r+relevant	inquiry	in+quiry
insufficient	in+sufficient	irrigate	in+r+rigate
intolerable	in+tolerable	insert	in+sert
inure	in+ure	intend	in+tend
invincible	in+vincible	invent	in+vent

The preceding table demonstrates that the prefixes *in*^{-1,2} assimilate to *il-* before <l>, to *ir-* before <r>, and to *im-* before <b, m, p>; elsewhere they remain *in-*. Notice that in the words with *im-* the stems start with the bilabial sounds [m], [b], or [p]. The assimilation of sounds continues today: If you listen carefully, you will probably find that most people pronounce *input* with the assimilated [im-put] rather than [in-put]. In fact, *Webster's Third International Unabridged Dictionary* shows the assimilated form as an acceptable variant pronunciation, but with no concomitant variant spelling. Exercise 4.6, p. 124

Dis-. The prefix *dis-* usually adds a negative or reversive meaning, as in *dishonor* or *disunite*. It has an assimilation pattern surprisingly like that for *ex-*:

Table 4.7

Words	Analyses	Descriptions
disarray	dis+array	Simple Addition
disbarred	dis+barred	Simple Addition
discord	dis+cord	Simple Addition
disdain	dis+dain	Simple Addition
disease	dis+ease	Simple Addition
differ	dis+f+fer	<s> is replaced with <f>, or Full Assimilation

Words	Analyses	Descriptions
disfigure	dis+figure	Simple Addition
digestion	diſ+gestion	<s> is deleted
disgorge	dis+gorge	Simple Addition
dishonor	dis+honor	Simple Addition
disintegrate	dis+integrate	Simple Addition
disjunction	dis+junction	Simple Addition
dilapidated	diſ+lapidated	<s> is deleted
disloyal	dis+loyal	Simple Addition
diminish	diſ+minish	<s> is deleted
dismiss	dis+miss	Simple Addition
disnature	dis+nature	Simple Addition
disobey	dis+obey	Simple Addition
displease	dis+please	Simple Addition
disquieting	dis+quieting	Simple Addition
direct	diſ+rect	<s> is deleted
disreputable	dis+reputable	Simple Addition
disperse	diſ+spere	<s> is deleted
distress	diſ+stress	<s> is deleted
distort	dis+tort	Simple Addition
disuse	dis+use	Simple Addition
divide	diſ+vide	<s> is deleted
disvalue	dis+value	Simple Addition

The prefix *dis-* usually combines via simple addition, but it assimilates fully before <f> and partially via <s> deletion before the clusters <sp> and <st>; it sometimes assimilates partially before the voiced consonants <g>, <l>, <m>, <r>, and <v>. **Exercise 4.7, p. 125**

Palatalization

Palatalized Spellings. When a sound is palatalized, it is pronounced back in the mouth, against the hard palate. For instance, the sound spelled <t> in *native*, [t], is not palatalized; it is pronounced forward in the mouth. But the sound spelled <t> in *nation*, [sh], is palatalized; it is pronounced well back against the roof of the mouth, against the palate. We will say that we are dealing with a palatalized spelling when a letter like <t>, which normally spells a nonpalatal sound as it does in *native*, spells one that has been palatalized, as it does in *nation*.

There are several different palatalizations. For instance, palatalization leads to [sh] being spelled not only <t> as in *nation*, but <s> in *dimension*, <ss> in *succession*, <sc> in *luscious*, <c> in *ancient*, even <x> in *sexual*. The sound [ch], as in *church*, is spelled <t> about a third of the time, in words like *statuesque*, *virtuosity*, and *actual*. The sound [j], as in *judge*, is spelled <d> in words like *graduate* and *schedule*. And the sound [zh], which often comes from French where it is spelled <g> (*sabotage*, *camouflage*), has developed some palatalized spellings: It is <s> in *casual* and *leisure*, <z> in *seizure* and *azure*, even <t> in *equation*.

Palatalization is very common in English, especially with sounds spelled <t>, and it leads to some curiosities in our spelling. For instance, although we normally associate the sound [sh] with the <sh> spelling, as in *shush*, [sh] is actually spelled <sh> only about a quarter of the time. More than half the time, because of palatalization, it is spelled <t>, as in *nation*.

Palatalized spellings are due to changes in pronunciation that occurred many hundreds of years ago. For instance, the sound [t], which <t> normally spells, is pronounced by pressing the tongue against the back of the upper teeth or against the dental, or alveolar, ridge from which the teeth grow. If you move your tongue back so that it presses against your palate and try to pronounce [t], you make a sound that is like [t] followed by a [sh], [tsh], which is actually the [ch] sound. So the palatalized pronunciation of [t] was originally [tsh]. Over the centuries the [tsh] normally eased to [sh]. Thus, the <t> spelling of [sh] is due to the movement of the sound back in the mouth, to the palate, followed by an easing of [tsh] to [sh]. The basic trigger is the unstressed <i> following the <t>: When that unstressed <i> is followed by another unstressed vowel, it typically simplifies to a [y]-like glide, and the sequence [ty] pulls the tongue back onto the palate. That movement back to the palate leads first to [tsh] and ultimately to [sh].

AES provides more details on palatalized spellings in chapter 30, “The Palatal Sibilants,” and most books on English phonetics and phonology discuss palatalization in considerable detail. Otto Jespersen’s (hard to find) *A Modern English Grammar on Historical Principles*, volume 1: *Sounds and Spellings* also has a good historical description (sections 12.21-12.22 and 9.87-9.88). Some linguistics refer to palatalization as *assibilation*, because it leads to a sibilant, or hissing, sound: the non-sibilant [t] becomes the sibilant [sh].

Out of the many issues involved in palatalized spellings, we will focus here on just one. Since the suffix *-ion*, which forms nouns out of verbs, as in *act* and *action*, starts with two unstressed vowels, it provides the setting for palatalizing the consonant before the *-ion*, as in *action*. In earlier English *-ion* was pronounced as two syllables, with two full vowel sounds. Over time they weakened, causing the [i] to ease to the glide [y] and the vowel spelled <o> to reduce to schwa. The [y] glide triggered the palatalization. Since *-ion* is such a common and productive suffix in modern English, we will take a special look at palatalization in words ending in *-ion*. This means that we will be looking at the so-called "shun" words — that is, words that end with the syllable [shən], spelled, for instance, <tion> (*nation*), <sion> (*dimension*), or <ssion> (*succession*). We will also discuss with some "zhun" words, like *conversion*. Other palatalized spellings will be discussed in chapter five.

The Suffix *-ion* and [shən]. The suffix *-ion* is added to verbs to form nouns, as in *infect*, *infection*. In many cases the stem and suffix combine via simple addition:

Table 4.8

Verbs	Nouns	Verbs	Nouns
abort	abortion	except	exception
act	action	exempt	exemption
addict	addiction	exhibit	exhibition
assert	assertion	express	expression
audit	audition	inhibit	inhibition
construct	construction	insert	insertion
convict	conviction	intersect	intersection
corrupt	corruption	intuit	intuition
direct	direction	invent	invention
discuss	discussion	prevent	prevention
distort	distortion	recess	recession
edit	edition	subtract	subtraction

All of those final <t>'s in the verbs listed above are remnants of Latin past participle stems.

In many cases, the suffix and verb combine via final <e> deletion, especially with verbs that end with the suffix *-ate*:

Table 4.9

Verbs	Nouns	Verbs	Nouns
abbreviate	abbreviation	graduate	graduation
associate	association	ignite	ignition
complete	completion	imitate	imitation
constitute	constitution	obligate	obligation
contribute	contribution	pollute	pollution
delete	deletion	promote	promotion
devote	devotion	recreate	recreation
distribute	distribution	stagnate	stagnation
expedite	expedition	vacate	vacation

Words with <ition>. Many "shun" words are really "ishun" words — that is, they end in [i-shən], spelled <ition>, like *ignition* and *expedition* in the list above. If we have an intermediate form ending <it> or <ite>, we explicate the noun with *-ion* to that intermediate form: *ambition* = amb + it + ion and *ignition* = ign + ité + ion. If we do not have an intermediate form ending <it> or <ite>, we will treat the <it> as part of the suffix *-ition*, an extension of *-ion*: *proposition* = pro + posé + ition, *addition* = add + ition. Notice that in the following table, the majority of the words contain the base *pose*, which comes from the past participle of Latin *ponere* "to put, set in place":

Table 4.10

Verbs	Nouns	Analyses	Forms with <i>-ite</i>
appose	apposition	apposé + ité + ion	apposite
compete	competition	competé + ition	
compose	composition	composé + ité + ion	composite
juxtapose	juxtaposition	juxtaposé + ition	
oppose	opposition	opposé + ité + ion	opposite
suppose	supposition	supposé + ition	
transpose	transposition	transposé + ition	

Webster's Third Unabridged does show *supposit*, with no final <e>. The *Oxford English Dictionary* shows an obsolete *proposite* and a now rare *supposite*, meaning "a being that

exists by itself” and “a grammatical subject.” And, of course, at any time someone may find a need for one of the missing forms with *-ite*, such as, for instance, <transpose>, in which case we would have to change our analysis to show this new reality.

The following table presents a sample of [i-shən] words and illustrates the various sources and analyses of the <it>:

Table 4.11

Words	Analyses
abolition	abol+ition
acquisition	ad+c+quisé+ité+ion
ambition	amb+it+ion
competition	com+peté+ition
definition	de+finé+ité+ion
deposition	de+posé+it+ion
edition	ex+dit+ion
exhibition	ex+hibit+ion
expedition	ex+ped+ité+ion
intuition	in+tuit+ion
nutrition	nutri+ition
opposition	ob+p+posé+ité+ion
position	posé+it+ion
recognition	re+cogn+ition
superstition	super+stit+ion
transition	trans+it+ion

Exercise 4.8, p. 125

Sets. In verb-noun pairs such as *transmit, transmission; receive, reception; inscribe, inscription; presume, presumption*, it is clear that the noun in each pair is directly related to the verb. The bases in these words belong to what we call *sets*. A set consists of two or more elements that work together as a team. They are related etymologically and they are usually more or less similar in spelling and meaning. We put the elements of a set inside curly braces, like this: {*mit, miss*}, {*ceive, cept*}, {*scribe, script*}, and {*sume, sumpt*}. With such sets we choose one element in certain settings, another in different settings. For instance, if you want to form a verb, choose *mit*, but when you want to form

a noun with *-ion* from that verb, you have to choose *miss*, so it is *transmit* but *transmission*. Other examples:

Table 4.12

Sets	Verbs	Nouns in <i>-ion</i>
{ceive, cept}	perceive	perception
{ceive, cept}	receive	reception
{duce, duct}	produce	production
{duce, duct}	reduce	reduction
{mit, miss}	admit	admission
{mit, miss}	permit	permission
{scribe, script}	describe	description
{scribe, script}	inscribe	inscription
{sume, sumpt}	assume	assumption
{sume, sumpt}	consume	consumption
{tend, tent ¹ }	attend	attention
{tend, tent ¹ }	contend	contention
{tain, tent ² }	detain	detention
{tain, tent ² }	retain	retention

Tent¹ descends from Latin *tendere*, “to stretch”; tent² descends from Latin *tenere*, “to hold or keep.”

The {*mit, miss*} set demonstrates an important point: According to the Twinning Rule, you might expect verbs ending in <mit> to twin the <t> when adding *-ion*. But they do not; they take the base *miss* from the set instead. Twinning would lead to <admittion>. And the sound [shən] is never spelled <ttion> in English. It can be <tion>, <sion>, or <ssion> — but never <ttion>.

The Set {*cede, ceed, ced, cess*}. There are some fairly common and important verbs that descend from the Latin verb *cedere*, “to go.” These verbs all contain a base that is pronounced with a long <e>, but sometimes is spelled <cede>, sometimes <ceed>. The set {*cede, ceed, ced, cess*} can create nasty problems for spellers.

Part of the problem is due to the fact that in the word *proceed* the base is spelled <ceed> and remains <ceed> in inflected forms like *proceeding*, but when it adds the suffix *-ure*, it shifts to the base in the set spelled <ced>: *procedure*. It helps to

remember that *exceed*, *proceed*, and *succeed* are the only three verbs that choose the base spelled <ceed>. Some memory gimmicks can help, too. You could try a sentence like "If you **proceed** and do not **exceed**, you will **succeed**." Or just remember the word SPEED: The <S> reminds you of *succeed*, the <P> reminds you of *proceed*, the <E> of *exceed*, and the <EED> reminds you of the spelling of the base itself, *ceed*:

Succeed
Proceed
E xceed
E
D

Table 4.13 illustrates the fact that sometimes the *-ion* can be deleted from nouns with the base *cess* to form other verbs or nouns. Again the missing forms may someday be put to use as speakers and writers feel a need for such a word:

Table 4.13

Verbs	Nouns in <i>-ion</i>	Minus <i>-ion</i>
accede	accession	access
concede	concession	
intercede	intercession	
precede	precession	precess
proceed	procession	process
recede	recession	recess
secede	secession	
succeed	succession	success
proceed	procession	process

The *OED* shows an obsolete noun *concess* meaning "concession," an obsolete verb *intercess* meaning "to intercede," and an obsolete noun *secess* meaning "a withdrawing, retirement."

Supersede, often misspelled *<supercede>, is completely unrelated to the {*cede*, *ceed*, *ced*, *cess*} set. It comes from Latin *sedēre*, "to sit." Etymologically, *supersede* means "to sit above."

The Set {*tend*, *tent*¹, *tense*}. Earlier we said that [shən] cannot be spelled <tition>. It also cannot be spelled <dion>, which affects what happens when *-ion* is added to verbs with the base *tend* from the set {*tend*, *tent*¹, *tense*}:

Table 4.14

Verbs	Nouns	Analysis
pretend	pretension	pretensé+ion
extend	extension	extensé+ion
contend	contention	content+ion
intend ¹	intention	intent+ion
intend ²	intension	intensé+ion
attend	attention	attent+ion
distend	distension	distensé+ion
distend	distention	distent+ion

Clearly there is the stuff of spelling problems here. In these words, when should [shən] be <tion>? When <sion>? And what are the differences between the two nouns formed from *intend* and between the two formed from *distend*?

There is one easy answer here: The noun formed from *distend* is just one word that can be spelled either of two ways, <distention> or <distension>. However, *intention* and *intension* are two quite different words: *Intention* is the more common word, meaning something like "purpose, motive." *Intension* has a number of senses, but it is most commonly used by logicians and semanticists.

All in all, it makes sense to start by saying, "When adding *-ion* to verbs with the base *tend*, usually its <tion>, seldom <sion>, and never <dion>." The only two you are likely to encounter with <sion> are *extension* and *pretension*. And they are just a plain nasty pair. Notice, for instance, that we have *extensive* but also *extent*! And we also have *pretense* but *pretentious*.

Exercise 4.9, p. 126

Some Conclusions about [shən]. As you've seen, verbs like *succeed* and *commit* involve some fancy maneuvers when *-ion* is added to them. But beyond that they behave regularly enough. That is, they form nouns that end with [shən] spelled <tion>, <ssion>, or <sion>: *abbreviation*, *discussion*, *tension*.

Obviously the issue of adding *-ion* to turn verbs into nouns that end with the sound [shən] is a complicated one. But it is not chaotic, nor is it whimsical. It is systematic and patterned. Admittedly, there is a bit of perversity injected here and there, as with <ceed> and <cede> or with <tent> and <tense>. The foregoing pages, though not complete, at least block out the main lines of the issue — and suggest some things to expect when spelling *-ion* nouns that end with the sound [shən].

Exercise 4.10, p. 127

The Suffix *-ion* and [zhən]. Usually nouns that are formed by adding *-ion* to a verb end with the sound [shən]. But sometimes these nouns end with [zhən]. The difference between [zhən] and [shən] is slight enough that can be hard to hear. Sometimes although you can't hear the difference at first, you can feel it— just as with the two sounds of <th> in *bath* and *bathe*. Put your fingers lightly on your throat just under your chin. Say [shən] several times. You should feel no buzzing when you pronounce [sh], which is a voiceless sound. Now say [zhən]. When you pronounce [zh], the voiced partner of [sh], you should feel a buzzing caused by the vibration of your vocal cords. You vibrate your vocal cords when you pronounce a voiced sound like [zh] but not when you pronounce a voiceless sound like [sh]. Here are a number of examples of nouns with [shən] and [zhən]:

Table 4.15

Nouns With [shən]	
affection	extradition
suspicion	intension
compression	interruption
constitution	passion
contradiction	pretension
propulsion	extension
Nouns With [zhən]	
collision	explosion
conclusion	immersion
conversion	invasion

Notice that in the table above while [shən] is usually spelled <tion>, it can also be spelled <cion>, <ssion>, or, if the <s> is preceded by <n> or <l>, <sion.> In a database of more than 128,000 words, there are 85 words with <lsion> or <nsion>, and all are pronounced with [shən]. But [zhən] is always spelled <sion> — and never with <n> or <l> preceding the <s>.

Exercise 4.11, p. 128

Shortening Rules

By shortening rules we mean rules that motivate a short vowel sound where a larger pattern – such as *vcv* – would normally indicate a long one. For instance, in the word *sanity*, the <a> heads a *vcv* string, <ani>, and would normally be expected to be long, as it is in its stem *sane*. The fact that <a> spells the short sound [a] in *sanity* is due to a shortening rule, in this case the Suffix *-ity* Rule. We will discuss three types of

shortening rules: (i) suffix rules, like that for *-ity*, (ii) the Third Vowel Rule, and (iii) the French *Lemon* Rule.

Suffix Rules. There are two main suffixes rules, one for *-ity*, the other for *-ic*:

Suffix *-ity* Rule. The Suffix *-ity* Rule states that the suffix *-ity* is regularly preceded by a vowel that is stressed and short, even if it heads a *vcv* string. The *-ity* rule motivates shortening of the stem vowel, as in *sane* with [ā] vs. *sanity* with [a], and it also motivates a shift of stress onto the vowel immediately preceding it, as in *civil* vs. *civility*, [sī-vəl] vs. [si-vīl-i-tē]. Some other examples with *-ity* added to free stems:

Table 4.16

Adjectives	Nouns	Adjectives	Nouns
active	activity	mental	mentality
cave	cavity	obscene	obscenity
electric	electricity	profane	profanity
extreme	extremity	public	publicity

Notice the shift from hard <c> to soft in pairs like *electric, electricity*, and *public, publicity*.

Some examples with *-ity* added to bound stems:

Table 4.17

Nouns	Analyses	Nouns	Analyses
ability	<i>abil+ity</i>	humility	<i>humil+ity</i>
atrocitiy	<i>atroc+ity</i>	unanimity	<i>un+anim+ity</i>
capacity	<i>capac+ity</i>	proximity	<i>proxim+ity</i>
charity	<i>char+ity</i>	quality	<i>qual+ity</i>

In *unanimity* the *un* is not a prefix; it is the bound base that means “one.” Etymologically, *unanimity* means “one spirit.”

The two long vowels that resist shortening by the Suffix *-ity* Rule are [ū] and its extended form [yū]:

Table 4.18

Adjective/Nouns ¹	Nouns ²	Adjective/Nouns ¹	Nouns ²
commune	community	nude	nudity
crude	crudity	opportune	opportunity

Adjective/Nouns ¹	Nouns ²	Adjective/Nouns ¹	Nouns ²
immune	immunity	pure	purity

Another preemption of the Suffix *-ity* Rule occurs when the vowel preceding the suffix is the head of a *v.v* string, as in *laity*, *deity*, *homogeneity*, *egoity*.

Notice the sequence of increasingly more localized preemptions: The very general and widespread *vcv* pattern is preempted by the more local Suffix *-ity* Rule, which is itself preempted by the even more local resistant long <u> and *v.v* string. This tendency of more local rules to preempt more general rules is typical of ruly systems.

Exercises 4.12-4.13, p. 128

The Suffix *-ic* Rule. The rule for *-ic* is identical to the rule for *-ity*. The suffix *-ic* is regularly preceded by a vowel that is stressed and short, even if the vowel is unstressed or long in the stem:

Table 4.19

Nouns	Adjectives	Nouns	Adjectives
athlete	athletic	state	static
atom	atomic	parasite	parasitic
demon	demonic	patriot	patriotic

When *-ity* is added to stems that end with the suffix *-ic*, the Suffix *-ity* Rule prevails, so the stress moves from the vowel preceding *-ic* in the stem to the <i> preceding *-ity*:

Table 4.20

Adjectives	Nouns	Adjectives	Nouns
authentic	authenticity	periodic	periodicity
eccentric	eccentricity	public	publicity
electric	electricity	tonic	tonicity

There are a few holdouts to the Suffix *-ic* Rule—for instance, *basic*, *scenic*, *phonemic*, *music*.

Exercise 4.14, p. 129

The suffixes *-it*, *-id*, *-ish*² (which forms verbs, like *finish*), and *-ule* also tend to be preceded by short stressed vowels, even if those vowels head *vcv* strings.

The Third Vowel Rule. The Suffix *-ity* Rule holds that the vowel sound in front of *-ity* will be stressed and short. The Third Vowel Rule is somewhat weaker: It says that the

third (or fourth) vowel sound from the end of the word will be short **if** it is stressed. Most instances of the Third Vowel Rule are words adapted from Latin, and they reflect the way Latin pronunciation was taught in British schools during late Middle Ages and Renaissance. A few instances, like *holiday*, are native English words, which reflect the fact that in Old English there was a strong tendency to shorten long vowel sounds in syllables three or more places back in a word.

In the following pairs, the first, the stem or a closely related shorter word, has a long vowel, while the second is a longer derived or related word that illustrates the Third Vowel Rule. Notice that in these words we are treating *-ion* as having two syllables, as it did back when the Third Vowel Rule affected it:

Table 4.21

Shorter Words	Longer Words	Shorter Words	Longer Words
compete	competitor	legal	legacy
crime	criminal	nation	national
decide	decision	nature	natural
deride	derision	navy	navigate
explain	explanatory	pose	positive

The Third Vowel Rule holds in hundreds and hundreds of words, perhaps thousands, but there are two familiar local rules that can preempt it:

- (i) the resistance of [ū] and [yū], as in *cuticle, enthusiast, fumigate, jubilee, luminous, mutilate, punitive, and unicorn*; and
- (ii) the v.v pattern. When the head vowel of a v.v string falls three (or four) places back in a word, it will resist shortening by the Third Vowel Rule: *dialect, iodine, piety, psychiatrist, reliable, violate, hyacinth, kaolin, peony*. Actually, there is a complex set of preemptions and preemptions of preemptions surrounding the very broad and powerful Third Vowel Rule. **Exercise 4.15, p. 129**

The French *Lemon* Rule. Compare the pairs of words below:

Table 4.22

demon, lemon	yodel, model	molar, scholar
driver, river	specious, precious	navel, gravel

In each pair the first word has the long vowel expected in the vcv pattern, but the second word has a short vowel heading a vcv string. This shortening is motivated by the French *Lemon* Rule. The second word in each pair was adapted into English from French; the first word in each pair was adapted from some other language. The French source word for *lemon* had stress on the second vowel, and the first vowel was short.

After *lemon* was taken into English, the primary stress went to the first vowel with the second vowel reduced. English prefers stress early in the word; French normally stresses the last syllable of a word. Since the first vowel of *lemon* had been short in French, it stayed short after the primary stress shifted to it in English. So *lemon* now has a short vowel at the head of a *vcv* string. Since we adapted so many words from French, this rule covers hundreds and hundreds of words. Some other examples:

Table 4.23

balance	dozen	metal	stomach
bigot	dragon	present	tenant
closet	hazard	proverb	tremor
column	honest	schedule	valiant
cover	legend	spinach	value
damage	lizard	statue	venom

Though it is a widespread and powerful rule, the French *Lemon* Rule does have a few holdouts, some of which are real, some only apparent.

Exercise 4.16, p. 129

Chapters two, three, and four have discussed elements, the procedures that control how elements combine, and some of the historical processes that have affected English spelling. With this information we can now look at the sound-to-spelling correspondences in English spelling.

5 The Sound-to-Spelling Correspondences

The following discussion divides sound-to-spelling correspondences into major and minor spellings. The major spellings are the most common and the most simple and straightforward—that is, the most ruly. The minor spellings, more like the memorized forms in Pinker’s distinction and some of which can seem at times downright bizarre, have three basic sources:

First, many of them echo the original spelling of the foreign words from which they were adopted—for example, the <ch> spelling of [k], as in *school* and *Christmas*, which echoes the Greek letter chi, <χ>, transliterated into the Roman alphabet as <ch>. Sometimes, especially during the 16th century with its Renaissance enthusiasm for things classical, Latinate respellings were introduced late, replacing earlier, more phonetic spellings. For instance, our word *debt* is a respelling of the earlier *dette*, the respelling due to the wish to reflect the Latin source word, *dēbitum*.

Second, and rarely, the respelling was a mistake that “took.” For instance, our word *ptarmigan* is a 17th century respelling of the Gaelic *tarmachan*, apparently due to the mistaken notion that the first syllable was related to the Greek base *pter* “wing, feather,” as in our words *helicopter* and *pterodactyl*.

Third, many more minor spellings are due to sound changes, usually simplifications by the elision of sounds. Since the written language always changes more slowly than the spoken, many words have letters in them that were once pronounced but no longer are. For example, in *tomb* the final was pronounced [b] up into the 14th century, when it began to fall silent, leading to the minor spelling <mb> of [m].

A Note on Silent Letters

In this discussion we use the notion of silent letters as little as possible. To be sure, we do speak of silent final <e> and treat it as a diacritic. But we seldom speak of silent consonant letters. Instead, we normally treat such letters as part of a minor spelling of a single consonant sound. For example, rather than treating the at the end of *tomb* as silent, we treat <mb> as a minor spelling of [m]. We do this in order to avoid positing a ghost-like unit of silence floating around in words.

The one major exception to this general approach is <gh>, which poses tough analytical problems in words like, say, *weigh* and *weight*. This <gh> is a vestige of an old fricative sound spelled <h> in Old English and <gh> in Middle English but now missing from our language. In words like *rough* and *laugh* this old fricative, which sounded much like the final consonant in the German pronunciation of *Bach* or the Scottish pronunciation of *loch*, became [f]. We say that in *weight* the <gh> is part of the spelling of the consonant [t], <ght>. But in words like *weigh* where the <gh> comes at the end of an element (and does not spell [f]), we treat it as a silent digraph, a

diacritic that marks long vowels and diphthongs, as in the following relatively few native words:

Table 5.1

After . . .	Instances
Long <a> spelled <ei>	<i>neigh, neighbor</i> (neigh+bor, “near dweller”), <i>weigh</i>
Long <i> spelled <i>	<i>high, nigh, sigh, thigh</i>
Long <o> spelled <ou>	<i>borough, dough, thorough, though</i>
[ou] spelled <ou>	<i>bough, plough, slough</i> ¹
Long <u> spelled <ou>	<i>slough</i> ² , <i>through</i>

The Front Stops, Especially [t]

The front stops are [p], [b], [t], and [d]. They are called stops because they are pronounced by stopping the flow of air and then releasing it quickly. They are called front stops because the air is stopped towards the front of the mouth: In [p] and [b], the bilabial stops, the air is stopped at the two lips; in [t] and [d], the dental stops, at the back of the upper dental ridge. As was pointed out in chapter one, [p] and [b] are a voiceless-voiced pair, as are [t] and [d].

The sound-to-spelling correspondences for the front stops are very simple and straightforward: Each has two major spellings that account for nearly 100% of the occurrences of the sound. The first, and far and away the most common, major spelling is the same letter that is used in square brackets to symbolize the sound: <p> for [p], for [b], <t> for [t], and <d> for [d]. The second major spelling in each case is the doublet of the first: <pp>, <bb>, <tt>, <dd>. Further, it is nearly always possible to tell when to choose the singleton and when to choose the doublet spelling:

Doublets occur at boundaries that

- (i) involve twinning: *ripping, ribbing, wetting, wedding*;
- (ii) involve a full assimilation: *appear, abbreviate, attempt*; or
- (iii) involve a simple addition that concatenates two instances of the same letter, as in *stepparent, dumbbell, outtalk, addict* – though in slow, careful speech many such words can have [p·p] or [t·t] rather than [p] or [t], as in [lamp·pōst] vs. [lam·pōst].

Within elements, doublets also occur regularly between a preceding short vowel and an element-final <le> (*ripple, dribble, little, middle*). And within elements they also occur regularly between a preceding short vowel and a succeeding vowel letter – that is, within the vcc pattern (*pepper, cabbage, lettuce, cheddar*).

Everywhere else the front stops are regularly spelled with the singleton <p>, , <t>, or <d>.

Remember that the *v_{CV}-v_{CC}* contrast is often preempted by one of the more local shortening rules: Thus, the Third Vowel Rule leads to singleton spellings after short vowels in words like *property*, *fabulous*, *satellite*, and *federal*. The Suffix *-ic* Rule leads to *microscopic*, *syllabic*, *narcotic*, *periodic*. The French *Lemon* Rule leads to *proper*, *cabin*, *atom*, *study*.

Each of the front stops has some minor spellings, most of which occur in a very few words. We'll look just at the minor spellings of [t]: There are several though all except one are restricted to a very small number of words. The most common one is the past tense and past participle suffixes *-ed*, pronounced [t] when added to verbs that end [f], [s], [p], [k], [ch], [sh] – that is, verbs that end with any voiceless sound other than [t] (*laughed*, *kissed*, *ripped*, *kicked*, *watched*, *wished*). The less common minor spellings are <th> (in the proper names *Thomas* and *Thames*, the spice *thyme*, and one pronunciation of *posthumous*), <bt> (in *doubt*, *debt*, and *subtle*), <pt> (*ptomaine*, *pterodactyl*, *ptarmigan*, *receipt*), <ct> (in *indict*), <dt> (in *veldt*), <cht> (in *yacht*), <tw> (in *two*).

Exercise 5.1, p. 130

The Back Stops, Especially [k]

The back, or velar, stops are the voiced-voiceless pair [g] and [k], as in *gig* and *kick*. The major spellings of [g] are <g> and <gg>, and the selection between the two is governed by the same principles as those for the front stops. On the other hand, the spellings of [k] are the most complex of all of the consonants. At the heart of the complexity is the fact that [k] has two major singleton spellings, <k> and the much more common hard <c>. It also has three doublet spellings: the most common <ck>, the less common <cc>, and the least common <kk>. Some of the minor singleton spellings occur in several words: <ch> from Greek, <q(u)> from the Norman French of the Norman scribes during early Middle English. Although the sound-to-spelling correspondences for [k] are quite intricate, there are still some simplifying patterns worth noticing.

The major singleton spelling <c> cannot occur before <e>, <i>, or <y>, so it tends to be more common before <a>, <o>, and <u>, while <k> is more common before <e>, <i>, and <y>: *cap*, *cop*, *cup*, but *kept*, *kid*, *sky*. Words with <k> before <a>, <o>, and <u> usually have a distinctly foreign or exotic look: *kangaroo*, *kona*, *kudzu*. While <k> nearly always occurs in free bases, often native English ones (*keen*, *kind*, *sketch*, *awake*, *shriek*), <c> occurs in many bound bases and affixes, usually Latinate (*catalog*, *comfort*, *contradict*, *capture*, *decorate*, *indicate*, *magic*, *maniac*, *minuscule*).

The major doublet spelling <ck> is similar in its distribution to the doublets discussed earlier: If no Shortening Rule applies, it occurs when following a short vowel spelled with a single vowel letter and preceding another vowel or <le> (*racket*, *beckon*, *chicken*, *hockey*, *bucket*; *tackle*, *freckle*, *tickle*, *cockle*, *knuckle*). It occurs at the end of free bases when the preceding vowel is short (*knack*, *neck*, *stick*, *stock*, *stuck*). It occurs in cases of <k> insertion: *trafficker*, *traffic+k+er*; *picnicking*, *picnic+k+ing*; *panicky*, *panic+k+y*.

The minor spellings of [k] are as follows: The rare <cc> occurs in cases of the full assimilation of *ad-*, *ob-*, and *sub-* (*account*, *occur*, *succulent*). (Notice that <cc> does not spell [k] before <e>, <i>, or <y>: It spells [ks] so [k] is spelled simply <c>, as in *accent* and *accident*.) The <cc> spelling also occurs after short vowels in a few adoptions that have retained their foreign look (*broccoli*, *moccasin*, *morocco*, *piccolo*, *raccoon*, *yucca*). About the only common words in which the even more rare <kk> occurs are forms of *trek* and *lek*: *trekked*, *trekking*, *trekkie*; *lekking*. The spelling <ch> nearly always occurs in Greek adoptions, representing the Greek letter chi (*character*, *Christmas*, *chronicle*, *echo*, *schedule*, *scholar*). The spelling <cch> occurs in *saccharin* and *zucchini*. The <q> and <qu> spellings were introduced into English by the Norman scribes during the early Middle Ages. The singleton spelling <q> occurs in words in which the <u> after the <q> spells [w]: *adequate*, *equip*, *quack*, *queen*, *question*, *squeak*, *squirrel*, *tranquil*. In cases where the <u> does not spell [w], we treat the <u> as part of the <qu> spelling of [k]: *antique*, *bouquet*, *grotesque*, *mosquito*, *opaque*, *turquoise*. The spelling <cq> occurs in words in which the prefix *ad-* assimilates to stems starting with <q>: *acquiesce*, *acquire*, *acquit*. The <cq> spelling can be thought of as a doublet for <q>. In words in which <x> spells the cluster [ks], we apparently must say that [k] is spelled <x>: *fix*, *export*, *explore*. But in words with <xc> spelling [ks], the [s] is spelled <c>, leaving the <x> again to spell [k]: *excess*, *excise*. The spelling <lk> occurs in a few native English words in which the earlier pronunciation [lk] has simplified to [k]: *chalk*, *folk*, *stalk*, *talk*, *walk*, *yolk*. The spelling <kh> occurs in a few adoptions from the Middle East: *ankh*, *khaki*, *khan*.

Exercise 5.2, p. 130

The Simple Fricatives, Especially [f]

The five simple fricatives—[f], [v], [θ], [ð], and [h]— have very straightforward spellings, the most complex being [f]. Except for a couple of new formations like *revved*, *savvy* with <vv>; *calve*, *halve*, *salve* with <lv>, and the single word *of* with <f>, [v] is always spelled <v>. Except for some very technical and rare words, like *phthisis*, [θ] and [ð] are always <th>, with word-final [ð] regularly marked with a diacritic silent <e>. The sound [h] is always spelled <h>, except in a very few words with the simplified <wh> spelling: *who*, *whole*, *whose*. Some words have initial <wh> pronounced [hw], or more commonly [ʰw], a case of metathesis that is being regularized as the [h] or [ʰ] disappears. For instance, the Old English word for *whale* was *hwæl*, pronounced as it was spelled. Today *whale* can be [hwāl] or [ʰwāl], but in everyday speech it is most commonly simplified and standardized to [wāl], a homophone of *wail*.

The major spellings of [f] are <f> and <ff>, and their distribution is similar to that for the singletons and doublets discussed with the stops. The major difference is that, except for *chef*, *clef*, and *if*, the doublet <ff> occurs regularly in word-final position after a short vowel spelled with a single vowel letter (*staff*, *cliff*, *scoff*, *stuff*). Otherwise <ff> occurs only at boundaries that

(i) involve twinning. But since so few words end in a single <f> following a short vowel, the only known instances of twinning are *iffy*, *iffier*, *inffiest*, and *iffiness*, and in inflections of the informal verb *ref*: *reffed*, *reffing*. Or

(ii) involve a simple addition that concatenates two instances of the same letter, the only common instances being words like *wolffish*, *wolf+fish*, and *shellful* *shelf+ful*, which in slow, careful speech have [f-f] rather than [f]. Or

(iii) involve the full assimilation of *ad-*, *dis-*, *ex-*, *ob-*, or *sub-*, a much larger group of words: *affect*, *different*, *effect*, *offer*, *suffer*.

Within elements <ff> also occurs regularly between a preceding short vowel and an element-final <le> (*raffle*, *waffle*, *sniffle*, *ruffle*). And within elements it also occurs regularly between a preceding short vowel and a succeeding vowel (*caffeine*, *traffic*, *griffin*, *coffee*, *buffalo*). Everywhere else the choice is <f> rather than <ff> (*after*, *cafeteria*, *deaf*, *defend*, *feast*, *leaf*, *profession*, *stifle*, *woof*).

The fricative [f] has relatively few minor spellings, each of which occurs in very few words: From Greek we get <ph>, representing the Greek letter phi, and <pph>, representing the Greek sequence pi-phi, < > (*alphabet*, *asphalt*, *metaphor*, *microphone*, *nephew*, *pharmacy*, *phrase*, *sphere*; *sapphire*, *sapphic*). The spelling <gh> occurs in a few native English words, the <gh> representing the Old English fricative discussed earlier: *cough*, *enough*, *laugh*, *laughter*, *rough*, *slough*³, *tough*, *trough*. The spelling <lf> occurs in *behalf*, *calf*, and *half*, the voiceless equivalent of the <lv> spelling of [v] mentioned earlier. The spelling <ft> occurs in *often* and *soften*.

Exercise 5.3, p. 131

The Palatal Sibilants, Especially [ch]

The palatal sibilants are [sh] as in *shush*, [zh] as in *azure*, [ch] as in *church*, and [j] as in *judge*. They are palatals because they are all pronounced with the tongue close to the palate; they are sibilants because they all have a distinct sibilant sound. Of the four, [sh] and [zh] are fricatives, the first voiceless, the second voiced. The voiceless-voiced pair [ch] and [j] are affricates. Although the native English spelling of [sh] was <sc> in Old English, which later became <sh>, today [sh] is usually spelled with one of the palatalized spellings discussed in chapter four. The voiced [zh] is much less common than its voiceless counterpart [sh]. It occurs in a number of French adoptions, with the spelling <g>: *barrage*, *massage*, *prestige*, *regime*. The voiced [j] is almost always spelled either <g>, <j>, or <dg>, which functions much like a double soft-<g>: *agitate*, *genuine*, *jealous*, *enjoy*, *banjo*, *fudge*, *pledge*.

The two major spellings of [ch] are <ch> and <tch>. The <tch> spelling functions as a doublet and only occurs after short stressed vowels, especially in word-final position: *clutch*, *scratch*, *watch*; *butcher*, *kitchen*. The palatalized spelling of [ch], <t>, most often occurs before an unstressed <u> that is followed by another unstressed vowel: *actual*, *impetuous*, *obituary*, *situation*, *virtual*. It is also fairly common before <ur>

(*adventure, capture, century, creature, moisture, vulture*) and somewhat less common before and <un>: *congratulate, fortune, spatula, tarantula*. Exercise 5.4, p. 131

The Nasals, Especially [n]

The nasals are [m] as in *sum*, [n] as in *sun*, and [ŋ], “eng,” as in *sung*. The major spellings of [m] are <m> and <mm>, which follow the same distribution described above for front stops. Eng is spelled <n> before [k] and [g]: *sink, twinkle, distinct, uncle, anchor, sphinx; anger, congress, hunger, linger*. Everyplace else eng is spelled <ng>: *among, bring, slung, wringer*.

The major spellings of [n] are <n> and <nn>, which also can be sorted out along the lines set down for the front stops: The doublet <nn> occurs only at element boundaries that

- (i) involve twinning: *sinned, gunner, fanning, tonnage*;
- (ii) involve a full assimilation: *annotate, announce, connect, connotation*;
- (iii) involve a simple addition that concatenates two <n>'s: *innocent, thinness*.

Within elements [nn] occurs regularly between a preceding short vowel and a succeeding vowel letter—that is, within the vcc pattern (*channel, penny, minnow, funnel*). The spelling <nne> seems not to occur in English, the spelling regularly being <nnel>: *channel, fennel, funnel, gunnel, kennel, tunnel*.

Among instances of <n> in shortened vcv strings, the Third Vowel Rule leads to singleton spellings in words like *animal, enemy, vinegar, monitor*. Suffix rules lead to *divinity, electronic, finish, serenity, vanish*. The French Lemon Rule leads to such words as *honor, panel*.

The nasal [n] has a number of minor spellings. The two most important are <kn> and <gn>. The <kn> spelling always occurs in base-initial position: *knee, knew, knife, knight, knock, knot, know, knuckle*. The <gn> spelling occurs in both initial and final position: *gnash, gnat, gnaw; assign, impugn, malign*. The <pn> spelling occurs only in the Greek base *pneum* “air, lung”. Other than *pneumonia*, the only other common word with <pn> is *pneumatic*. The spellings <mn> and <cn> occur in *mnemonic* “pertaining to memory” and the zoological term *cnida*. Exercise 5.5, p. 131

The Liquids, Especially [r]

The liquids, [l] and [r], are so called because they are smooth, prolonged sounds, produced without the friction of other smooth sounds like [s] and [f]. Their spelling is complicated, in the case of [l], by the existence of many variants involving either <l> or <ll> (*fulfill, fulfil; idyll, idyl*) and, in the case of [r], by the dramatic effect [r] has on preceding vowels (compare the vowels sounds in, say, *mare* and *mate*).

The two major spellings of [r], <r> and <rr>, account for about 99% of the cases of [r]. The minor spellings—<wr>, <rh>, <rrh>, <rps>, and <l>—account for less than 1%. The spelling <wr> occurs only in base-initial position in native English words (*wrap, wreath, write, wrong*). The <rh> and <rrh> spellings occur in words adapted from Greek (*rhapsody, rhinoceros, rhubarb, rhythm; catarrh, diarrhea, hemorrhage*). The very minor spelling <rps> occurs only in *corps* (compare the more ruly *corpse*), and the <l> spelling occurs only in *colonel*, which apparently has picked up the pronunciation of the earlier *coronel*.

Exercise 5.6, p. 132

The distinctions between the two major spellings of [r], <r> and <rr>, are not as settled and clear-cut as they are with the other consonants. They seem to be evolving towards the distributions listed above for the stops and other consonants, but the picture is clouded by the effect of [r] on preceding vowels, which often makes the vcv-vcc contrast much less reliable. For instance, in most dialects the vowel sounds in *mare* and *met* are more similar than those in *mare* and *mate*. This effect of [r] on preceding vowels, again, renders the vcv-vcc contrast rather unreliable, but we can at least say the following:

The sound [r] is spelled <r> rather than <rr>

1. in initial position: *rabbit, riot, abrupt*, ab+rupt;
2. in consonant clusters (in which [r] is extremely common): *angry, circle; darling, turkey*;
3. after long vowels and vowel digraphs: *courage, fiery, irony, theory*;
4. in shortened vcv strings: *asparagus, kerosene, parasite; carol, merit, severity*.

Less reliably [r] is usually spelled <r>

1. in word-final position: *liar, teacher, star, steer*, but *err, bizarre*;
2. after schwa: *calorie, giraffe, kangaroo*; but *corral, narration, terrific*;
3. in shortened vcv strings, though the quality of the preceding vowel is often altered appreciably by the [r]: *austere, scare, there, origin, deplore, zero, virile*.

The spelling is <rr> at boundaries affected by

1. twinning: *occurrence, warring, starred*;
2. assimilation: *arrest, arrange, corrosion, correct, irritate, irrigation, surrogate, surreptitious*;
3. a simple addition that concatenates two <r>'s: *interrupt, surrender, earring*.

The spelling <rr> also occurs in vcc strings within elements, again with the quality of the preceding vowel often altered by the [r]: *embarrass, narrow, merry, sorry, quarrel, borrow, mirror*).

The Semivowels, Especially [w]

The semivowel [y] is regularly spelled <y> and it occurs only in initial position (*you, year, beyond*). The semivowel [w] has a somewhat more complicated spelling. Its major spellings are <w> and <u>. A very minor spelling occurs in *one* and *once*, in which [wu] is spelled <o>. The modern pronunciation of *one* and *once* echoes an old diphthongized pronunciation, [uo], which developed into a full consonantal [w] plus [u]. The spelling <wh>, which is usually [hw] or [ʰw], often has variant pronunciations in [w]: *whale, wheel, while, why*.

The major spelling <u> occurs regularly after <q>: *queen, quit, quote*; less commonly after <g>: *languish, linguist, language, anguish*; even less often after <s> and <p>: *persuade, suave, suite; pueblo*. The major spelling <w> accounts for more than 90% of the occurrences of [w]. It does not occur in final position, but it is common in initial position and in a number of clusters: *want, weather, wit, women; swab, swell, swim; dwelling, schwa, between*.

Exercise 5.7, p. 132

The Short Vowels, Especially [e]

The major spellings of each of the short vowels account for the huge majority of instances. So even though the list of minor spellings is sometimes quite long, most of them occur in three or less words. Minor spellings arise from surviving dialect pronunciations and from various types of vowel sound changes over the centuries, with no concomitant changes in spelling. Remember that our [o] conflates at least two low back vowels (see chapter one). In the following tables, the spellings are in boldface. The major spellings are listed in order of their frequency of occurrence; minor spellings are listed alphabetically, with those that occur in three or less words marked with superscript exclamation points. The percentages given are from Hanna *et al* (1966):

Table 5.2

Short Vowels	Major Spellings	Minor Spellings	
[a]	bat (97%) (97%)	plaid [!] laugh [!]	
[e]	bed (93%) bread (4%) (97%)	again [!] says [!] friend [!]	heifer [!] leopard [!] bury [!]
[i]	bid (93.8%) syllable (2.5%) (96.3%)	pretty [!] been [!] counterfeit [!] sieve [!]	women [!] busy [!] build [!]

Short Vowels	Major Spellings	Minor Spellings
[o]	pot (79.6%) father (9.7%) autumn (6.5%) crawl (3%) (98.8%)	sergeant broad [!] cough knowledge [!]
[u]	bud (87.6%) come (9.8%) (97.4%)	blood [!] cousin
[u]	pull (58.3%) wood (31%) (89.3%)	woman [!] could [!]

As for the major spellings of [e], the <e> spelling is obviously far and away the most common, occurring in the settings typical for short vowels: *vcc* (*better, majestic, shelter*), *vc#* (*beg, den, met, step*), *vccie* (*assemble, gentle, pebble, settle*). It also occurs in shortened *vcv* strings: (*benefit, decimal; denim, melon, senate; epic, synthetic; extremity, serenity*). The <ea> spelling of [e] for the most part derives from a Middle English vowel sound similar to the vowel in the word *mare* and regularly spelled <ea>. For various reasons this Middle English vowel underwent sound changes but kept its old spelling. Most cases evolved into [ē] (*streak, beak*); a few evolved into [ā] (*steak, break*), and several evolved into [e]: *bread, heaven, pleasant, threat, health, weapon*. Notice that in the long-short variations in pairs like *heal, health; weal, wealth, clean, cleanse; deal, dealt, leap, leapt; steal, stealth*, [e] always occurs before a consonant cluster.

Exercise 5.8, p. 133

The Long Vowels, Especially [ā]

The major one-letter spellings of the long vowel sounds occur regularly in the tactical strings with long head vowels:

vcv: *baby, eked, lining, open, brute, cute*

ve#: *bee, tie, toe, due*

v.v: *chaos, react, lion, poetry, duet, genuine*

Tactical strings do not apply in the case of digraph spellings, which usually can occur in any context—for instance, in *seam* and *seem* [ē] is spelled with the digraphs <ea> and <ee> in what might appear to be a *vcv#* string. On the other hand, since within elements we tend not to follow a *vv* sequence with *cc*, it is, say, *leak* rather than *<leack.>

Table 5.3

Long Vowels	Major Spellings	Minor Spellings
[ā]	base (79.7%) bail (10.3%) bay (5.9%) (95.9%)	vein gauge ¹ grey bouquet café matinee ¹ break ¹
[ē]	cedar (43.7%) surely (39.4%) seam (6.6%) seem (6.2%) police (2.0%) (97.9%)	algae hockey quay ¹ chief receive amoeba people ¹
[ī]	smile (79.7%) type (16.7%) (96.4%)	aisle ¹ ties kayak ¹ coyote ¹ seismic buy ¹ geyser ¹
[ō]	wrote (86.8%) boat (5.0%) bowl (4.8) (96.6%)	chauffeur ohm ¹ bureau door ¹ yeoman ¹ shoulder sew ¹
[ū]	food (40.8%) flute (31.6%) (72.4%)	neutron soup news fruit prove buoy ^{1*}
[yū]	usual (92.3%) nephew (3.3%) feud (2.4%) (98.0%)	<i>beauty</i> <i>adieu</i> <i>view</i>

Among the major spellings of [ē], the <y> spelling is in a special category: It is always in final position and always weakly stressed. Following the lead of several dictionaries and scholars, Hanna and Hanna treat this <y> as spelling [i] not [ē]. I follow the practice of American college dictionaries and treat the <y> in words like *study* as spelling a weakly stressed long <e>. This spelling of [ē] is particularly common in the suffixes -y, -ly¹, and -ly²: *stormy*, *slowly*, *motherly*. When the [ē] is stressed, <e> is far and away the most common spelling.

The distribution of <ee> and <ea> is not at all clear-cut, as it illustrated by the existence of homophonous pairs such as *beach, beech; feat, feet; flea, flee; leak, leek; meat, meet; peak, peek; peal, peel; sea, see; tea, tee*.

Exercise 5.9, p. 133

A Note on <i> Before <e>. The old jingle has it,

It's <i> before <e>, except after <c>,
Or when spelling [ā], as in *neighbor* or *weigh*.

When spelling [ē], it is regularly <i> before <e> except after <c>. Thus it is <ie> in *achieve, belief, grieve, hygiene, piece, shriek*, but <ei> in *ceiling, deceit, perceive, receive*. The only known holdouts with [ē] spelled <ei> after something other than <c> are *either**, *protein**, *seize, weir, weird, leisure**. The only known holdout with [ē] spelled <ie> after <c> is *financier*.

The jingle also says that it is <ei> rather than <ie> when you are spelling [ā], a generalization with no known holdouts: *eight, neighbor, reign, vein, weigh*.

Expanding on the jingle somewhat, when you are spelling [ɪ], it is <ie> in final position (*die, hie, lie, pie, tie, vie*), but <ei> in initial and medial position (*eiderdown, either**, *height, kaleidoscope, neither*, poltergeist, seismic, sleight, stein*). The only known holdouts are *fiery* and *hierarchy*, with <ie> in medial position.

So far as spelling short vowels is concerned, the jingle holds quite well, the only known holdouts being *counterfeit, foreign, forfeit, heifer, sovereign, surfeit*—all of which have <ei> after something other than <c> (and three of which contain the same bound base, *feit*). The number of holdouts is quite modest in view of the hundreds of words that are covered by the jingle, especially if it is expanded to cover long <i>.

Exercise 5.10, p. 133

The Diphthongs [oi] and [ou]

Table 5.4

Diphthongs	Major Spellings	Minor Spellings
[oi]	boil (67%) boy (32.9%)	buoy ^{!*}
[ou]	foul (70.1%) fowl (29.8%)	tao [!] sauerkraut [!]

In both diphthongs the major spellings account for 99.9% of occurrences. Consistent with the more general tactics of <i> and <y>, almost always the <oy> spelling of [oi]

occurs in word-final position; <oi> in initial and medial. The only known holdouts are *oyster* and *gargoyle*.

The distribution of the <ou> and <ow> spellings of [ou] is almost but not quite clear-cut: It is <ow> in final position (*chow, cow, plow*), before vowels (*coward, power, vowel*), and before word-final [l] and [n] (*growl, howl, scowl; clown, drown, frown*). Just about everywhere else [ou] is spelled <ou>: *cloud, mouse, bounce, found, flour, mouth*. Holdouts to these patterns are *thou, foul, noun, chowder, crowd, powder*.

Exercise 5.11, p. 134

The Elusive Schwa, [ə]

Schwa is the weak, rather nondescript sound you hear at the beginning of *along* or *upon*. It is like a very weak “uh” sound. It is the most common vowel sound in English because most vowels, when they are unstressed, tend to reduce down to schwa. As we saw in the discussion of unstressed suffixes like *-ate* (chapter three above), some unstressed vowels tend to become [i], as in the adjective form of *approximate*, where the second <a> is unstressed and pronounced [i] in contrast with the verb form, where the second <a> is stressed and pronounced [ā]. In fact, *Webster's Third Unabridged* dictionary uses a special symbol, a dotted schwa, to indicate the range of sounds that unreduced vowels can have, from pure [ə] to unstressed [i]. Some scholars use a barred <i>, [ī], to represent the reduced, unstressed short <i>.

Though there is a range of sounds that unstressed vowels can have, we will speak simply in terms of schwa. For schwa is a formidable problem in and of itself, perhaps the largest single problem in English spelling.

The problem — though not its solution! — is simple enough: Schwa is hard to spell because it can be spelled by any vowel letter and nearly any combination of vowel letters. The bold italicized letters in the following words are twenty different spellings of schwa:

a bridge	sergeant	cab i net	o bscure
hallelu j ah	bure a ucrat	parli a ment	tort o ise
mount a in	sovere i gn	pati e nt	miracul o us
ep a ulet	lunche o n	anx i ous	calcul u s
em e rgency	right e ous	nasturt i um	oxy o gen

Obviously, when trying to spell schwa, sounding out the word will not help. What does help is thinking through the word, learning the kinds of things you've been learning about elements, procedures, processes, and word stress. Though there are no easy and simple rules for spelling schwa (and probably never can be), it helps to know some things about how words work. The most useful help has to do with word stress and stress-shifting.

Schwa and Stress-shifting. Schwa is always weakly stressed, but shifting the stress onto the syllable that contains the schwa usually reveals the fuller vowel sound that the schwa is reducing. And that can provide a helpful clue to its spelling.

Often you can shift the stress by adding and subtracting elements. In the word *satanic*, for example, the first vowel sound is a schwa: [sə-tan-ik], with stress on the second vowel, the [a]. But if we remove the suffix *-ic*, giving us the noun *satan*, the stress shifts to the first vowel, and we can hear the [ā], suggesting strongly that the vowel letter should be <a>. Again, if we are uncertain whether the adjective *confident* should be <ant> or <ent>, we can add the suffix *-ial*: *confidential*, with the stress shifted to the third vowel. We can now hear the [e] vowel, which suggests <ent>. This strategy of shifting the stress by adding, subtracting, or replacing elements (especially derivational suffixes) can often reveal which vowel letter to use to spell a schwa sound. In the following table, the words in the Original Words column all contain at least one schwa sound. The letters spelling the schwas we are interested in are italicized. In each word the vowel with primary stress is in boldface. Notice how the stress shifts between the original word and the shortened form and how with the shift the original italicized schwa becomes a recognizable full vowel:

Table 5.5

Original Words	Shortened Forms	Original Words	Shortened Forms
definite	defi n e	original	ori g in
excellent	excel	intonate	intone
sedative	sedate	breakfast	fast
cigarette	cigar	analogy	analog

Exercise 5.12, p. 134

Sometimes you can shift the stress in a word by adding elements. The suffixes *-ity*, *-ic*, and *-ial* are particularly useful for this kind of thing:

Table 5.6

Original Words	Lengthened Forms
professor	professor ial
patriot	patriot ic
solemn	solemn ity
polar	polar ity
existent	existent ial
symbol	symbol ic
artifice	artific ial
vocal	vocal ic , vocal ity

Exercise 5.13, p. 135

Sometimes the only way you can shift the stress in a word is by replacing certain elements with others. In the table below, the change shown in the Replacement column leads to the Stress-shifted Word. Notice how in the Stress-shifted Word the bold-faced schwa of the Original Word is now a full vowel with distinct coloring:

Table 5.7

Original Words	Replacements	Stress-shifted Words
comedy	<i>-ian</i> for <i>-y</i>	comedian
necessary	<i>-ity</i> for <i>-ary</i>	necessity
realize	<i>-ity</i> for <i>-ize</i>	reality
psychiatrist	<i>-ic</i> for <i>-ist</i>	psychiatric
credulous	<i>-ity</i> for <i>-ous</i>	cred <u>u</u> lity
specify	<i>-fic</i> for <i>-fy</i>	spec <u>i</u> fic
melody	<i>-ic</i> for <i>-y</i>	mel <u>o</u> dic
spontaneity	<i>-ous</i> for <i>-ity</i>	spontaneous
substance	<i>-antial</i> for <i>-ance</i>	substantial
inference	<i>-ential</i> for <i>-ence</i>	inferential

Exercise 5.14, p. 135

Some Conclusions about Schwa. Stress-shifting can help in two ways with spelling the elusive schwa. First, it can help as an after-the-fact heuristic: That is, faced with indecision as to whether *existent* should be <ent> or <ant>, remembering *existential* with the stress on the second <e> should give enough of the vowel coloring to remind you that it is <ent>. But stress-shifting can also help as a before-the-fact mnemonic: That is, trying to devise a tactic to help you remember that *liberal* is <al> not <el> or <le>, associating *liberal* with *liberality* can help plant the <a> more firmly in your memory. This process of associating a new word with a stress-shifted word in which a schwa is filled out, as in *liberal* vs. *liberality*, can be a very powerful mnemonic device.

But sometimes no amount of adding and subtracting and replacing elements will shift the stress enough to help. In cases like that, the best help (outside of your dictionary) is to be able to recognize common elements — especially prefixes and suffixes, which are often unstressed and thus often contain schwas. Remember especially the discussion of assimilated prefixes. It also helps to be able to recognize bases from Latin and Greek because Latin and Greek bases often occur in quite long words, which

contain schwas. If you can recognize — or at least suspect — prefixes, suffixes, and common Latin and Greek bases, you can often figure out how to spell schwa.

The foregoing five chapters have attempted to describe modern English spelling in a way that heightens the sense of pattern and ruliness and minimizes the amount of word-by-word memorization that is too often seen as the only feasible approach to learning and teaching our spelling system. Steven Pinker offers a dichotomy between words and rules, the first being essentially items that must be memorized one at a time, the second being patterns and procedures that allow a much more efficient, less memory-intensive approach to spelling. *Spelling for Teaching* recognizes that words, or at least elements, must ultimately be learned one-by-one but that their spelling is shot through with much more pattern and ruliness than is usually recognized and that this ruliness is understandable, describable, and thus teachable and learnable.

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Exercises

1.1 Sort the following words into the ten groups defined below. Most words will go into more than one group:

magic	language	might	government
enough	type	women	new
yellow	away	your	why
seventy	quick	holiday	below

Words with the vowel . . .

<a>	<e>	<i>	<o>

Words with the vowel . . .

<u>	<w>	<y>

Words with the consonant <w> . . .

--	--	--

Words with the consonant <y> . . .

--	--

Words with the consonant <u> . . .

--	--

1.2 Sort the following words into the groups described below:

head	crab	height	front
used	bowl	call	weight
crew	gypped	could	real

the short vowels:		the long vowels:	
[a]		[ā]	
[e]		[ē]	
[i]		[ī]	
[o]		[ō]	
[u]		[ū]	
[y]		[yū]	

1.3 In the blank following each word write in the sound symbol of the vowel sound you hear in that word:

cap _[] _[]	pane _[] _[]	dam _[] _[]	red _[] _[]
cape _[] _[]	pain _[] _[]	dame _[] _[]	reed _[] _[]
rip _[] _[]	met _[] _[]	dim _[] _[]	throw _[] _[]
ripe _[] _[]	meat _[] _[]	dime _[] _[]	boat _[] _[]
boil _[] _[]	howl _[] _[]	coin _[] _[]	clown _[] _[]
hop _[] _[]	meet _[] _[]	sin _[] _[]	head _[] _[]
hope _[] _[]	cup _[] _[]	sign _[] _[]	on _[] _[]
pan _[] _[]	dune _[] _[]	moan _[] _[]	two _[] _[]

Here are some that may be a bit harder:

ton _[] _[]	canned _[] _[]	grief _[] _[]	piece _[] _[]
tone _[] _[]	caned _[] _[]	niece _[] _[]	twelfth _[] _[]
quit _[] _[]	through _[] _[]	nice _[] _[]	ninth _[] _[]
quite _[] _[]	aisle _[] _[]	height _[] _[]	tries _[] _[]
read _[] _[] or _[] _[]	ghost _[] _[]	reign _[] _[]	try _[] _[]

ton _[]_	canned _[]_	grief _[]_	piece _[]_
seize _[]_	shriek _[]_	yolk _[]_	eighth _[]_
above _[]_ and _[]_	conceal _[]_ and _[]_		

1.4 Sort the following 24 words into the groups described below. Most groups will contain more than one word, and most words will go into more than one group:

bathe	ghost	mission	this
beyond	hush	nature	treasure
brings	hymn	of	unhappy
docks	jamming	patch	wild
engage	kitty	squeegee	worry
fives	laugh	thinly	years

Words with . . .

the voiceless stops:		the voiced stops:	
[p]		[b]	
[t]		[d]	
[k]		[g]	

Words with . . .

the voiceless fricatives:		the voiced fricatives:	
[f]		[v]	
[s]		[z]	
[th]		[ð]	
[sh]		[ʒ]	
[h]			

Words with . . .

the voiceless affricate:		the voiced affricate:	
[tʃ]		[dʒ]	

Words with the nasals . . .

[m]	
[n]	
[ŋ]	

Words with the liquids . . .

[l]	
[r]	

Words with the semivowels . . .

[w]	
[y]	

2.1 Below you are given 25 elements. Most of them are also words. You are to sort them into the four groups described in the table. If you do it correctly, all of the unshaded blanks should be filled.

mattress	course	grief	ghost	column
seize	yolk	aisle	magazine	clique
less	cinnamon	height	picnic	rhythm
nickel	niece	-s	shriek	glimpse
eight	queue	tomato	yoke	reign

Elements with three syllables	Elements with two syllables	Elements with one syllable		
The element with less than one syllable is _____.				

Follow-up. *Queue* [kyū] has become common lately with the spread of computers and their queues. It is a French reshaping of the Latin *cauda*, *cōda* “tail.” It has the homophonic variant *cue*, as in “pool cue.”

2.2 Look up the following elements in your dictionary: *moth*, *broth*, *-er*. Then answer this question: We can divide the word *mother* into the spellings <moth> and <er>, and we can divide *brother* into <broth> and <er>. Both *moth* and *broth* are words, and *-er* is

a suffix, so all three are elements. But are the spellings <moth>, <broth>, and <er> elements of the words *mother* and *brother*? How do you know?

Follow-up: The point here is that <moth>, <broth>, and <er> are not elements in *mother* and *brother* because you cannot form the meaning of *mother* or *brother* by combining the meanings of the words *moth* or *broth* with either of the two suffixes *-er*. In short, mothers do not moth, nor are brothers more broth. The larger point is that in defining elements in words we must pay careful attention not just to sound and spelling but also to meaning.

2.3 All of the words below consist of two or more elements, one of which is a free base. The three words in any one set all have the same free base. Find the free base in each set, as has been done with the first one:

Sets of Words	Free Bases
1. clearly, unclear, clearance	
2. repaint, painter, painted	
3. worded, forewords, wordy	
4. rhythmical, rhythms, unrhythmic	
5. changeable, changing, changes	
6. spelling, misspell, spellers	
7. undoubtedly, doubts, doubtful	
8. abused, misusing, usefully	
9. performance, information, reformed	
10. peaceful, peaceable, peacemaker	

2.4 The sets of words below are like those in Exercise 2.3, except that the bases in the words in each set are bound. Find the bound base in each set:

Sets of Words	Bound Bases
1. invade, pervade, evades	
2. effective, defective, affected	
3. dominate, condominium, domineer	
4. insistence, resisted, persists	
5. exceedingly, succeeded, proceeds	
6. exceptionally, interception, accept	

Sets of Words	Bound Bases
7. commission, dismissed, missile	
8. commit, admits, permit	
9. referee, conference, prefers	
10. counterfeit, forfeited, surfeit	

Follow-up: Notice that *miss* is a bound base here, even though we also have two free bases, or words, spelled <miss>, as in “We all miss Miss Smith.” The *miss* in the table above is not the same as either of the words spelled <miss>. The *miss* that means “to regret the absence of” is a Germanic word; it does not come from Latin. The *miss* that refers to a woman is simply a shortened form of *mistress*, which comes from Old French. The bound base *miss* in the table comes from a Latin word that meant “send, throw.” So the two free bases and one bound base spelled <miss> are not related to one another at all, except in their spelling and pronunciation.

2.5 Use the etymological information in your dictionary to determine the etymological meaning of the bound bases you found in the ten sets in Exercise 2.4:

Bound Bases	Languages of Origin	Etymological Meanings
1. vade		
2. fect		
3. domin		
4. sist		
5. ceed		
6. cept		
7. miss		
8. mit		
9. fer		
10. feit		

2.6 Each of the forty words below contains one of eight different bound bases. Decide what the eight bound bases are; fill in the blank in each of the eight headings with one of the bound bases. Then sort the words into the groups:

abscess	consistent	perspective	prediction
accept	deception	congested	resistant
dictator	assistant	perceptive	persist
accessed	addicted	spectacle	excessive
digestion	successful	subject	gesture
susceptible	conjecture	inspector	trajectory
spectator	suggest	adjective	intercepted
gestation	defective	effect	insisted
affect	circumspect	necessary	perfection
contradict	verdict	projectile	infected

Words with _____ :	Words with _____ :	Words with _____ :	Words with _____ :
Words with _____ :	Words with _____ :	Words with _____ :	Words with _____ :

2.7 Below you are given ten plural nouns that are formed by adding either -s or -es to a singular noun. Divide each plural noun into its singular noun plus suffix:

Plural Nouns	=	Singulars	+ Suffixes
taxes	=		+
guesses	=		+
buzzes	=		+
periods	=		+
waltzes	=		+
columns	=		+
acres	=		+

Plural Nouns	= Singulars	+ Suffixes
strengths	=	+
searches	=	+
brushes	=	+
squares	=	+

2.8. Write the correct plurals of each of the following singular nouns, showing any <y> to <i> changes:

Singular Nouns	+ Suffixes	= Plural Nouns
city + <i>i</i>	+ <i>es</i>	= <i>cities</i>
ego	+	=
anxiety	+	=
auxiliary	+	=
tomato	+	=
library	+	=
calendar	+	=
try	+	=
toy	+	=
piano	+	=
hero	+	=
quantity	+	=

2.9 The following paragraph contains twelve words that contain inflectional suffixes. Underline the words, and then list the suffixes and the meaning that each one adds to its stem word. The first one is done for you. Some suffixes and words occur more than once:

Sharon and I record folk ballads. I sing tenor and she sings alto and plays the guitar. Her voice may not be as clear as Janet's but Sharon plays a much sweeter guitar and may be the mellowest singer I know. Last year she played nothing but hymns, but this year she will also be playing folk songs and even some of the guys' home-made rock.

Suffix	Meaning	Suffix	Meaning
1. -s	"More than one"	7.	
2.		8.	
3.		9.	
4.		10.	
5.		11.	
6.		12.	

2.10 Three derivational suffixes that turn verbs into nouns are *-ance*, *-ion*, and *-ment*. Select the proper one of these three for each verb below and write it in the "Suffix" column. In the "Noun" column write out the noun the verb plus suffix spells.

Verbs	+ Suffixes	= Nouns
amend	+ <i>ment</i>	= <i>amendment</i>
appear	+	=
arrange	+	=
attend	+	=
environ	+	=
equip	+	=
exhaust	+	=
govern	+	=
perform	+	=
possess	+	=
resist	+	=

2.11 The five suffixes *-al*, *-ful*, *-ish*, *-ous*, and *-less* turn nouns into adjectives, which then can take *-ly* to form adverbs. For each noun below, pick out the appropriate suffix and write out the adjective formed. Then write out the adverb.

Noun	+	-al, or -ful, or -ish, or -ous, or -less	= Adjective	+	-ly	= Adverb
accident	+	<i>al</i>	= <i>accidental</i>	+	<i>ly</i>	= <i>accidentally</i>
critic	+		=	+	<i>ly</i>	=
devil	+		=	+	<i>ly</i>	=
doubt	+		=	+	<i>ly</i>	=
fear	+		=	+	<i>ly</i>	=
fiend	+		=	+	<i>ly</i>	=
fool	+		=	+	<i>ly</i>	=
force	+		=	+	<i>ly</i>	=
form	+		=	+	<i>ly</i>	=
hope	+		=	+	<i>ly</i>	=
moment	+		=	+	<i>ly</i>	=
outrage	+		=	+	<i>ly</i>	=
peace	+		=	+	<i>ly</i>	=
thank	+		=	+	<i>ly</i>	=
thought	+		=	+	<i>ly</i>	=
use	+		=	+	<i>ly</i>	=

Nine of the sixteen nouns above can take more than one suffix to form adjectives. For instance, the noun *hope* can take *-ful* and *-less* to form *hopeful* and *hopeless*. Write down the other eight nouns that can take more than one suffix:

2.12 In the table below there are five sets of nouns. Use the space in the "Analyses" column to analyze each of these nouns into its stem plus suffix. All the nouns in a set have the same suffix. In the "Definitions of Suffixes" column define the common suffix in each set. After you've given the job of defining these five suffixes a good go, look them up in your dictionary to see how well you did.

Sets of Nouns	Analyses	Definitions of Suffixes
eyelet		
piglet		
booklet		
ringlet		
heiress		
hostess		
countess		
priestess		
handful		
eyeful		
mouthful		
armful		
spoonful		
lapful		
childhood		
godhood		
sainthood		
humorist		
terrorist		
motorist		
tourist		
organist		
journalist		
violinist		

2.13 Each of the following words is a compound that consists of two free stems. Analyze each word into its two stems:

Compound Words	Analyses into Free Stems
rattlesnake	
searchlight	
windmill	
handkerchief	
bloodstain	
doorknob	
darkroom	
underline	
kettledrum	
fingernail	
congressman	
bookkeeping	

2.14 All of the following words started out as bound elements in longer free stems. Try to figure out what the longer word was for each. Write down your answer in the blank. Then double-check in your dictionary. Sometimes your dictionary will help you by defining the newer short word with the original longer one. Sometimes it will help you by giving you the original longer word in the etymology of the shorter word.

pro:	ad:
phone:	photo:
flu :	burger:
bike:	ism:
bra:	radio:

Follow-up. The *advantage* that has been clipped to *ad* is a term familiar to tennis players. It is likely that *ism* was abstracted from various words ending in *-ism* rather than from the suffix itself, especially words like *communism*, *socialism*, and *capitalism*.

2.15 Define each of the following terms in one or more complete sentences. Include an example in each of your definitions.

analysis: _____

element: _____

syllable: _____

base: _____

free base: _____

bound base: _____

etymological meaning: _____

affix: _____

prefix: _____

suffix: _____

An **inflectional suffix** is _____

A **derivational suffix** is _____

stem: _____

free stem: _____

compound word: _____

3.1 In the table below sometimes you are given words to analyze into their elements; sometimes you are given elements to combine into words, and sometimes you are given both the elements and words. After you have done the analysis or the combining, describe any changes in the spelling when the elements combined. In the appropriate columns enter any letters that are inserted, any letters that are deleted, and any that are

replaced by others. Sometimes there is more than one change. If you can't find any of these three changes in a word, and the elements follow the Rule of Simple Addition, put an "X" mark in the "Simple Addition" column. The first two words have been done for you.

Elements	Words	Changes			
		What's been inserted?	What's been deleted?	What's been replaced?	Simple Addition
ad+fix+ing	<i>affixing</i>			<d> with <f>	
ceil+ing	<i>ceiling</i>				×
	changeable				
	coolly				
de+cide+ion	decision				
	deleted				
de+lete+ion					
dis+aster+ous	disastrous				
ex+ceed+ed					
ex+cept+ion					
	fathead				
fore+head					
in+sert+ion					
inter+cede+s					
	likely				
	misspell				
phys+ic+al					
picnic+ing	picnicking				
pro+fess+or					
pre+fer+ence					
re+al+ize					
re+ceive					

Elements	Words	Changes			
		What's been inserted?	What's been deleted?	What's been replaced?	Simple Addition
	replacement				
re+sist+ance					
	safety				
se+cret+ary					
	severely				
	skies				
	spellbinder				
sub+fix	suffix				
	supersede				
twin+ing					
	underworld				
verb+al+ize					
	wishfully				
	yourself				

3.2 Analyze the following words as we have done with the first set of three. In each of the sets you will find two different stems. Enter the stems in the proper column:

Words	Analyses	Stems
mat <u>ting</u>	<i>mat+t+ing</i>	<i>mat</i>
mat <u>ing</u>	<i>maté+ing</i>	<i>mate</i>
mateless	<i>mate+less</i>	
snippy		
sniper		
snipes		

Words	Analyses	Stems
slimmest		
slimly		
slimy		
grimmer		
grimness		
grimy		
spinner		
spinal		
spineless		
winnable		
winy		
winery		
hatful		
hating		
hateful		
fatty		
fatal		
fateful		

3.3 Double underline the vowel with primary stress in each stem and in each derived or inflected word. Then single underline any inserted twin consonants. The first one is done for you.

Stems	Derived and Inflected Words		
prop <u>el</u>	prop <u>el</u> ler	prop <u>el</u> ling	prop <u>el</u> lant
profit	profiting	profiteering	profitable
regret	regretting	regrettable	regretful
solid	solidify	solidity	solidarity
symbol	symbolic	symbolism	symbolize

Stems	Derived and Inflected Words		
system	systemic	systematic	systemize

3.4 Double underline the vowels with primary or secondary stress in each stem and in each derived or inflected word. Then single underline any inserted twin consonants. You will probably find it easiest to mark the primary stress first, then identify the vowel or vowels bearing the weak stress, and finally mark any in the middle, if there are any. If you have trouble at first hearing the difference between primary and secondary stresses, try exaggerating the difference between syllables: Shout one, and whisper the others. Then reverse the order. Remember that if you can't make up your mind about a stress pattern, after giving it a good and honest try, check your dictionary.

Stems	Derived and Inflected Words		
<u>eavesdrop</u>	<u>eavesdropped</u>	<u>eavesdropper</u>	<u>eavesdropping</u>
handicap	handicapped	handicapper	handicapping
pettifog	pettifogged	pettifogger	pettifogging
prohibit	prohibiting	prohibition	prohibitive
waterlog	waterlogged	waterlogging	waterlogs
zigzag	zigzagged	zigzagger	zigzagging

3.5 The following table presents pairs of variant spellings, both of which are correct according to at least some dictionaries. You should decide which spelling fits your Twinning Rule and write it in the "Better fit" column. It stands to reason that if you have a good rule on one hand and choice of spellings on the other, you might as well choose the spelling that better fits the rule. In the "Reasons" column write out the reason that variant does seem to you to fit your Twinning Rule.

Variant Spellings	Better Fit	Reasons
kidnaper		
kidnapper		
programer		
programmer		
traveling		
travelling		

3.6 Sort the words into the appropriate blanks:

price lodge niche trice mettle
 prince lode nice trickle mete
 valve dunce twinge ape solve
 vale dune twine apse sole
 cage wince scene bridge lace
 cadge wine sense bride lance

Words with a Short Vowel		Words with a Long Vowel	

3.7 In the table below double underline the primary and secondary stresses and fill in the pronunciation of *-ate* in *intimate* and the other five words as has been done for *elaborate*. Try at first on your own. Then check your ear against the stress patterns and pronunciations in your dictionary.

Adjectives		Verbs	
Stress Pattern	Sound of <i>-ate</i>	Stress Pattern	Sound of <i>-ate</i>
e <u>l</u> aborate	[it]	e <u>l</u> abor <u>a</u> te	[āt]
intimate		intimate	
moderate		moderate	
alternate		alternate	
certificate		certificate	
degenerate		degenerate	
subordinate		subordinate	

3.8 Check the etymologies of the words in the table below and sort them into the four groups described. (Note. Several of the words in this table have variant, often dialectal, pronunciations with stress on the final syllable, leading to [ɪ] or sometimes [ē]: *crystalline*,

genuine, intestine, bowline, trampoline, turbine. For the sake of this exercise, we assume the pronunciation with unstressed <i>.)

bowline	doctrine	genuine	medicine
caffeine	engine	heroine	trampoline
crystalline	examine	imagine	turbine
destine	famine	intestine	urine

Words from Middle English Verbs Ending in <i>-inen</i>	Words from Latin Nouns Ending in <i>-ina</i>	Words from Latin Adjectives Ending in <i>-inus</i>	Words from Other Sources

3.9 Sort the words into the appropriate blanks:

sum	shad	blue	pop	scrap	sue	shade
club	pope	scrape	let	flee	gym	rat
see	lie	glue	con	rate	sit	mat
rod	cone	rob	site	mate	rode	scheme
flute	tie	glut	tree	toe	dye	style

	Vowel Sounds	
Vowel Spellings	Short Vowels	Long Vowels
<a>	[a]	[ā]

	Vowel Sounds	
Vowel Spellings	Short Vowels	Long Vowels
<e>	[e]	[ē]
<i>	[i]	[ī]
<y>		
<o>	[o]	[ō]
<u>	[u]	[ū]

3.10 Sort the words into the four groups described, then fill in the blanks:

arc	disc	hinge	singe
big	fence	Icelandic	swig
bulge	fierce	lunge	tic
change	flange	ounce	tinge
choice	fleece	peace	voice
cringe	garlic	prince	voyage
dance	hag	rug	zinc

Group 1: Words Ending in <c>	Group 2: Words Ending in <ce>	Group 3: Words Ending in <g>	Group 4: Words Ending in <ge>

How is <c> pronounced in Group 1, without silent final <e>? _____. How is <c> pronounced in Group 2, with silent final <e>? _____. How is <g> pronounced in Group 3? _____. How is <g> pronounced in Group 4? _____.

3.11 Sort the words in into two groups, depending on the sound <th> spells in them.

clothe	sheath	teeth	wreathe	scythe
loath	sheathe	teethe	wreath	seethe
loathe	wrath	length	moth	myth

Words in which <th> = [th]	Words in which <th> = [θ]

3.13 Look at the spelling of the fifteen words in the table below. Pronounce each of them. Then sort them into the two groups described. If you can't make up your mind about a word, try writing it without the final <e> and deciding how it would be pronounced if it were spelled that way. If the pronunciation doesn't seem to change, then the final <e> does not mark a consonant or vowel sound. If the word minus the final <e> doesn't end with a <u>, <v>, or a single <s> or <z>, the final <e> is not insulating anything either — and the word belongs in Group 2.

alive	bizarre	brochure	demitasse
brassiere	comrade	avalanche	cigarette
crevasse	derange	belle	breeze
clientele	debutante	explode	breathe

Group 1: Words in which Final <e> Marks or Insulates	Group 2: Words in which Final <e> Does Not Mark or Insulate	

3.14 Sort the words into the two groups described:

feminine	judge	medicine	pipette	route
gazelle	kitchenette	millionaire	plague	statuette
gazette	layette	morale	submerge	questionnaire
grille	love	nocturne	race	tongue
have	lucerne	oblige	romaine	troupe
imbecile	madame	palette	rosette	vaudeville
impasse	marriage	peace	roulette	zygote

Words in which Final <e> Marks or Insulates	Words in which Final <e> Does Not Mark or Insulate	

Words in which Final <e> Marks or Insulates	Words in which Final <e> Does Not Mark or Insulate	

3.15 Sort the words into the two groups:

are come eye none shoe
awe done forbade one some
bade dye gone rye tee
bye ewe lye see woe

Group 1: Words with Final <e> Due to the Short Word Rule		Group 2: Words with Final <e> Due to Other Reasons	

3.16 Put an "X" in the "Marking vowel" column if the final <e> is marking a long vowel in that word. Put an "X" in the "Marking consonant" column if the final <e> is marking a soft <c> or <g> or a voiced <th> in that word. Put an "X" in the "Insulating" column if it is keeping a <v> or <u> or a single <s> or <z> from coming at the end of the word. Notice that in some words final <e> is doing more than one thing at a time.

Words	Marking Vowels	Marking Consonants	Insulating
adze			

Words	Marking Vowels	Marking Consonants	Insulating
bathe			
clothe			
copse			
deluge			
dense			
drive			
engage			
freeze			
grave			
hive			
huge			
lace			
lapse			
lathe			
louse			
moose			
pace			
plague			
prize			
rampage			
range			
rogue			
slave			
stage			
tense			
trace			
vague			

Words	Marking Vowels	Marking Consonants	Insulating
wage			

3.17 Analyze each word into its stem plus suffix, showing any cases of <e> deletion:

Words	=	Analyses
refereeing	=	
freest	=	
seer	=	
guaranteeing	=	
foreseeable	=	

3.18 Analyze each word into its stem plus suffix, showing any cases of <e> deletion:

Words	=	Analyses
ties	=	
died	=	
dying	=	
pies	=	

3.19 Analyze each word into its stem plus suffix, showing any cases of <e> deletion:

Words	=	Analyses
canoed	=	
canoeist	=	
horseshoer	=	
horseshoeing	=	

3.20 Analyze each word into its stem plus suffix, showing any cases of <e> deletion:

Words	=	Analyses
embraceable	=	
voiceless	=	

Words	=	Analyses
embraceable	=	
manageable	=	
chanceful	=	
peaceable	=	

3.21 Analyze each word into its stem plus suffix, showing any cases of <e> deletion:

Words	Analyses	Words	Analyses
clothing		scatheful	
seething		scythes	
sheather		breather	

3.22 Analyze each word into its stem plus suffix, showing any cases of <e> deletion:

Words	Analyses	Words	Analyses
groovy		tensor	
hoarseness		tonguing	
lapsus		unbelievable	
leagued		valvule	
leaguer		waiver	
loving		wheezes	
oozing		wheezing	

3.23 Analyze each word into its stem plus suffix, showing any cases of <e> deletion:

Words	Analyses
imaginary	
eyed	
eyeful	
examination	
engineer	

Words	Analyses
torturous	
infinity	
infinitely	
cigarettes	
nocturnal	

3.24 Analyze each word into its stem plus suffix, showing any cases of <e> deletion:

Words	Analyses	Words	Analyses
courageous		rampageous	
diffusible		rampages	
easement		rangy	
engaging		riser	
fusion		sagely	
gracious		slavishly	
lacy		spacing	
outrageous		vaguest	

3.25 The stems of the following words all contain final <e>'s that mark preceding long vowels. Analyze the words into their free stems and suffixes. Show any cases of deletion:

Words	Analyses
baker	
bribed	
compensatory	
consumable	
creation	
dividable	
famous	
graceful	

Words	Analyses
graded	
granulose	
hasten	
inscribable	
lifeless	
likable	
mated	
mistakable	
notable	
ogled	
polar	
quaked	
rifling	
ripen	
ruler	
shaking	
smoking	
staples	
wasting	

3.26 Analyze each word into its stem plus suffix, showing any replacing of <y> with <i>:

Words	= Analyses
stories	=
carries	=
monkeying	=
merrily	=
trial	=
day	=

Words	= Analyses
buoyed	=
iciest	=
employee	=
betrayal	=

4.1 All of the words below contain some form of the prefix *com-*. Analyze each word in the "Analysis" column into its prefix plus stem. In the "Before" column put the first letter of the stem to which the prefix is being added. If the *com-* simply adds to the stem with no changes in spelling, put an "X" in the "Simple Addition" column. If the [m] assimilates fully so that it and the letter <m> in *com-* are replaced by the first sound and letter of the stem — thus making a double consonant, as in *collide* and *corrode* — put an "X" in the "Full Assimilation" column. If the assimilation is only partial and the <m> is replaced with an <n>, put an "X" in the "Partial Assimilation" column. And if the <m> in *com-* deletes and nothing replaces it, put an "X" in the "<m>-Deletion" column:

Words	Analysis: Prefix + Stem	Before	Simple Addition	Assimilation		<m> Deletion
				Full	Partial	
concern	con n +n+cern	<c>			X	
congeal						
compound						
coalition						
coefficient						
collaborate						
commemorate						
correlation						
contingency						
conscious		<sc>				

4.2 Follow the instructions for Exercise 4.1:

Word	Analysis: Prefix+Stem	Before	Simple Addition	Full Assimilation	<d> Deletion
accommodate					

Word	Analysis: Prefix+Stem	Before	Simple Addition	Full Assimilation	<d> Deletion
addicted					
adhesive					
arrival					
affluent					
advertise					
accomplish					
attractive					
ascension		<sc>			
agnomen		<gn>			

Follow-up: In *agnomen* we put <gn> in the “Before” column even though the historical stem is *nomen* “name,” the <g> having been inserted in Latin because the Romans apparently took the word to be related to *agnoscere*, “to recognize.”

4.3 Analyze each word into its prefix and stem. In the “Description” column indicate what happened when the prefix and stem combined:

Words	Analysis	Description
exaggerate	ex+aggerate	<i>Simple Addition</i>
edit		
exception		
emotion		
elaborate		
erected		
exhibit		
evolution		
exporter		
effort		

4.4 Follow the instructions for Exercise 4.3:

Words	Analysis	Description
subdivide		
succinct		
suffocate		
support		
submit		
suspicion		
subsidy		

4.5 Follow the instructions for Exercise 4.3:

Words	Analysis	Description
syndicate		
syllabic		
synagogue		
symptom		
synthetic		
synonym		
sympathy		

4.6 Sort the following words into the two groups given below. Then analyze each word into its prefix plus stem, being careful to show any assimilations that take place:

instill insert impression illuminate
 infallible inform impatient irresistible
 insanity inflexible illegitimate irradiate

Words with <i>in</i> ⁻¹ , "not"	Analysis	Words with <i>in</i> ⁻² , "in"	Analysis
<i>infallible</i>	< <i>in</i> + <i>fallible</i>	<i>instill</i>	< <i>in</i> + <i>still</i>

Words with <i>in</i> ⁻¹ , “not”	Analysis	Words with <i>in</i> ⁻² , “in”	Analysis

4.7 Follow the instructions for Exercise 4.3:

Words	Analysis	Description
disadvantage		
diffusion		
disorganized		
digression		
diffidence		
dilation		
disjointed		
divorce		
discord		
dirigible		

4.8 In the table below you are given a number of analyses of words that end with [ishən]. In the Words column write out the word indicated by the analysis. Notice the various sources of the <it> in the <ition> ending.

Words	Analyses
<i>admonition</i>	ad+mon+ition
	ad+m+mun/ition
	ad+p+par+ition
	ad+t+trite+ion
	aud/i+it+ion
	cogn+ition
	corn+n+dite+ion

Words	Analyses
	corn+n+trité+ion
	de+mol+ition
	dis+posé+it+ion
	ebull//+ition
	ex+rudé+ité+ion
	ex+posé+it+ion
	extra+dité+ion
	fruit+ion
	in+m+posé+it+ion
	in+hibit+ion
	in+quis+ité+ion
	part+ité+ion
	peté+ition
	pre+mon+ition
	pre+posé+it+ion
	pro+hibit+ion
	pro+posé+it+ion
	re+peté+ition
	re+quis+ité+ion
	sed+it+ion
	sub+p+posé+it+ion
	tra+dité+ion
	volit+ion

4.9 In the table below you are given a number of sets of bases, and either a verb or a noun in *-ion* containing a base from each set. Fill in the missing verb or noun for each set:

Sets	Verbs	Nouns in <i>-ion</i>
{ceive, cept}	conceive	conception

Sets	Verbs	Nouns in <i>-ion</i>
{ceive, cept}	deceive	
{mit, miss}	commit	
{mit, miss}		omission
{mit, miss}	emit	
{mit, miss}		intermission
{mit, miss}	remit	
{mit, miss}		submission
{scribe, script}	ascribe	
{scribe, script}		prescription
{sume, sumpt}	presume	
{sume, sumpt}		resumption
{tain, tent ² }	abstain	
{tend, tent ¹ }		distention

4.10 The following is a list of nouns ending in [shən] spelled <ssion> or <tion>. Sort them into the two groups described in the table. Then answer the questions after the table:

- | | | | |
|--------------|-------------|--------------|--------------|
| abbreviation | composition | discussion | omission |
| action | compulsion | distortion | opposition |
| attention | deception | exhibition | organization |
| competition | description | exhilaration | succession |
| completion | detention | tension | suspension |

Words Ending in <tion>	Words in <sion> and <ssion>

In words ending in [shən] spelled <tion> what letters precede the <t>? ____, ____, ____, ____, ____, ____, and _____. In words ending in [shən] spelled <ssion> what letters precede the <ss>? ____, ____, and _____. In words ending in [shən] spelled <sion> what precedes the <s>? ____ or ____.

4.11 For each of the *-ion* nouns listed in the table indicate whether it ends in [shən] or in [zhən]. In cases of doubt, don't be reluctant to use your dictionary:

Nouns	[shən] or [zhən]	Nouns	[shən] or [zhən]
distension	[shən]	prevention	
diversion		precision	
donation		retrogression	
erosion		revision	
eviction		session	
exertion		suspicion	
explosion		submersion	

4.12 Add *-ity* to each of the following adjectives to form a noun. Then double underline the vowel with the primary stress in both the adjective and the noun:

Adjectives	Nouns	Adjectives	Nouns
grave		real	
intense		serene	
liberal		sublime	

In the nouns are the vowels immediately preceding the *-ity* long, or are they short?
_____.

4.13 Analyze each of the following nouns into its bound stem plus *-ity*. Then double underline the vowel with primary stress in each noun:

Nouns	Analyses	Nouns	Analyses
ferocity		levity	
fidelity		velocity	
frivolity		vicinity	

In the nouns are the vowels immediately preceding the *-ity* long, or are they short?

_____.

4.14 Add *-ic* to each of the following nouns to form adjectives, showing any changes that take place. The double underline the vowel with primary stress in each noun and adjective:

Nouns	Adjectives	Nouns	Adjectives
melody		organ	
mime		telescope	
ocean		tone	

In the adjectives are the vowels immediately preceding the *-ic* long, or are they short?

_____.

4.15 Double underline the vowel with the primary stress in each of the longer words. Then put an “X” in the 3rd Vowel? column if that stress falls on the third vowel from the end of the word. Finally, put an “X” in the Short? column if that stressed vowel is short:

Shorter Words	Longer Words	Third Vowel?	Short?	Shorter Words	Longer Words	Third Vowel?	Short?
gene	<u>g<u>e</u>neral</u>	X	X	supreme	supremacy		
grade	gradual			precede	precedence		
grain	granular			sacred	sacrilege		
rite	ritual			site	situate		
solo	solitude			compete	competitor		

4.16 Pronounce each of the following words. Based on the first vowel sound in each, put an “X” after each word that you suspect is adapted from French:

agate X
agent
gofer
govern

pedal
pekoe
menace
mesa

medal
clamor
laden
penance

crevice
private
crisis
value

5.1 Sort the following words into the table:

attainments	ditto	out take	stifle
attempted	exempt	outricked	streams
cattails	fattest	quitting	tattoo
cattle	inattention	rattrap	tomato
committee	lettuce	regretted	unattached

Words with [t] spelled . . .

<t>		<tt> due to . . .			
		Twining	Assimilation	Simple Addition	VCC or VCCle

The two words with [t] spelled <ed> are _____ and _____.

5.2 Sort the following words into the following two tables:

according	consequence	mosquito	quantity	squirrel
antique	folksy	o'clock	remarks	succumb
breakfast	hawk	occasion	schlock	technology
chalky	kitchen	picnic	school	walking
Christmas	knocking	picnickers	scientific	wrecker
chuckle	liquor	provoke	skunk	zodiac

Words with [k] spelled . . .

<c>		<k>		<ck>	

<cc>	<ch>	<q>	<qu>	<lk>

<cc>	<ch>	<q>	<qu>	<lk>

5.3 Sort the following words into the table:

buffalo	counterfeit	fascinate	indifferent
certify	effective	fluorescent	paragraph
coffee	efficient	friendly	shelf
coughing	elephant	iffy	waffle

Words with [f] spelled . . .

<f>	<ff> due to . . .			<ph> or <gh>
	Assimilation	Twinning	VCC or VCCle	

5.4 Sort the following words into the table:

achieve	fortune	nature	spinach	teacher
actual	kitchen	purchase	statue	watchful
church	mischief	questions	suggestion	wretched

Words with [ch] spelled . . .

<ch>	<tch>	<t>

5.5 Sort the following words into the table:

annihilate	cinnamon	innocent	resigned	twinning
beginner	columnist	minnow	skinniest	unannounced
cannot	connection	nuisance	tennis	unnecessary

Words with [n] spelled . . .

<n>	<nn> due to . . .			
	Twining	Assimilation	Simple Addition	The VCC Pattern

The word with [n] spelled <gn> is _____.

5.6 Sort the following words into the table:

acquire corrected referred rhyme terrify
 arrival interpretation rewritten rhythm wrapping
 breathe interrupt rhinoceros surrounded wrong

Words with [r] spelled . . .

<r>	<rr>	<wr>	<rh>

5.7 Sort the following words into the table:

awhile misquoted quick square twisted
 dwelling nowhere require swimmer whales
 language persuade rewards toward woman

Words with [w] spelled . . .

<w>	<u>	<wh>

5.8 Sort the following words into the table:

apples	laughed	soft
bottle	number	someday
bridge	question	taught
bull	rhythm	threaten
could	scratch	touch
good	sister	yellow

Words with the short vowel . . .

[a]	[e]	[i]	[o]	[u]	[ʊ]

5.9 Sort the following words into the table:

believe	height	teachers
boast	music	those
bowled	rule	typed
cube	school	used
eight	she	while
favor	station	whose

Words with the long vowel . . .

[ā]	[ē]	[ī]	[ō]	[ū]	[yū]

5.10 Sort the following words into the table:

achieve	foreign	lies	receive
ceiling	height	neighbor	seismic
counterfeit	hierarchy	pie	shriek
fiery	hygiene	piece	weigh

Words with . . .

instances of the <i> before <e> rule			holdouts to the <i> before <e> rule

5.11 Sort the words into the table:

adjoin appoint clown doubt grouch ointment
allow blouse destroy employ moisture ours
annoy choice devout gouge oily vowel

Words with . . .

[oi] spelled . . .		[ou] spelled . . .	
<oy>	<oi>	<ow>	<ou>

5.12 In this exercise the schwas that you are to spell are written with a <ə> in the Original Words column. Subtract elements to shift stress to the vowel spelled <ə>. Write out the shortened form, and in the right-hand column write the correct spelling of each original word.

Original Words	Shortened Forms	Correct Spelling of Original Words
confədent	confide	confident
distəllation		
məniacal		
təlegraphy		
negətive		

Original Words	Shortened Forms	Correct Spelling of Original Words
læborious		
accommodate		
illustrative		
dramatic		
osteopathy		

5.13 Again the schwas that you are to spell are written with a <ə> in the Original Word column. Add elements to shift stress to the vowel spelled <ə>. Write out the lengthened form, and in the right-hand column write the correct spelling of each original word.

Original Word	Lengthened Form	Correct Spelling of the Original
arəd	aridity	arid
prejudəce		
facəle		
flaccəd		
finəl		
residənt		
punctuəl		
geniəl		
periəd		
sterəl		
neutrəl		

5.14 Yet again the schwas that you are to spell are written with a <ə> in the Original Words column. Shift the stress onto the schwa by making the replacement described in the Replacements column. Write out the stress-shifted word, and then in the right-hand column write the correct spelling of each original word.

Original Words	Replacements	Stress-shifted Words	Correct Spelling
ənalʏsɪs	<i>lyze for lysis</i>		
psɪkələdʒɪkəl	<i>-y for -ical</i>		
bɑːbərəs	<i>-ian for -ous</i>		
bɪblɪəgrəfi	<i>-ic for -y</i>		
kənˈsɜːvətɪzəm	<i>-ion for -ism</i>		
præɡmətɪzəm	<i>-ic for -ism</i>		
ɪksɪˈstɛns	<i>-ential for -ence</i>		

Answers

1.1 Words with the vowel . . .

<a>	<e>	<i>	<o>
magic	enough	magic	enough
language	yellow	quick	yellow
away	seventy	might	women
holiday	language	holiday	your
	type		holiday
	women		government
	government		below
	new		
	below		

Words with the vowel . . .

<u>	<w>	<y>	
enough	yellow	seventy	holiday
your	new	type	why
	below	away	

Words with the consonant <w> . . .

away	women	why
------	-------	-----

Words with the consonant <y> . . .

yellow	your
--------	------

Words with the consonant <u> . . .

language	quick
----------	-------

1.2 Words with . . .

the short vowels:		the long vowels:	
[a]	crab	[ā]	weight
[e]	head	[ē]	real
[i]	gypped	[ī]	height
[o]	call	[ō]	bowl
[u]	front	[ū]	crew

the short vowels:		the long vowels:	
[ú]	could	[yū]	used

1.3

cap __[a]__	pane __[ā]__	dam __[a]__	red __[e]__
cape __[ā]__	pain __[ā]__	dame __[ā]__	reed __[ē]__
rip __[i]__	met __[e]__	dim __[i]__	throw __[ō]__
ripe __[ī]__	meat __[ē]__	dime __[ī]__	boat __[ō]__
boil __[oi]__	howl __[oU]__	coin __[oi]__	clown __[oU]__
hop __[o]__	meet __[ē]__	sin __[i]__	head __[e]__
hope __[ō]__	cup __[u]__	sign __[ī]__	on __[o]__
pan __[a]__	dune __[ū]__	moan __[ō]__	two __[ū]__

ton __[u]__	canned __[a]__	grief __[ē]__	piece __[ē]__
tone __[ō]__	caned __[ā]__	niece __[ē]__	twelfth __[e]__
quit __[i]__	through __[ī]__	nice __[ī]__	ninth __[ī]__
quite __[ī]__	aisle __[ī]__	height __[ī]__	tries __[ī]__
read __[e] or [ē]__	ghost __[ō]__	reign __[ā]__	try __[ī]__
seize __[ē]__	shriek __[ē]__	yolk __[ō]__	eighth __[ā]__
above __[ə] and [u]__	conceal __[ə] and [ē]__		

1.4 Words with . . .

the voiceless stops:		the voiced stops:	
[p]	patch, unhappy	[b]	bathe, beyond, brings
[t]	ghost, kitty, treasure	[d]	beyond, docks, wild
[k]	docks, kitty, squeegee	[g]	engage, ghost

Words with . . .

the voiceless fricatives:		the voiced fricatives:	
[f]	fives, laugh	[v]	fives, of
[s]	docks, ghost, squeegee, this	[z]	brings, fives, years
[th]	thinly	[th]	bathe, this
[sh]	hush, mission	[zh]	treasure
[h]	hush, hymn, unhappy		

Words with . . .

the voiceless affricate:		the voiced affricate:	
[ch]	nature, patch	[j]	engage, jamming, squeegee

Words with the nasals . . .

[m]	hymn, jamming, mission
[n]	beyond, engage, mission, nature, thinly
[ŋ]	brings, jamming

Words with the liquids . . .

[l]	laugh, thinly, wild
[r]	nature, treasure, worry, years

Words with the semivowels . . .

[w]	squeegee, wild, worry
[y]	beyond, years

2.1

Elements with three syllables	Elements with two syllables	Elements with one syllable		
cinnamon	mattress	seize	queue	shriek
tomato	nickel	less	grief	yoke
magazine	picnic	eight	aisle	clique
	column	course	height	glimpse
	rhythm	yolk	ghost	reign
		niece		
The element with less than one syllable is <u>-s</u> .				

2.2 The point here is that <moth>, <broth>, and <er> are not elements in mother and brother because you cannot form the meaning of mother or *brother* by combining the meanings of the words *moth* or *broth* with either of the two suffixes *-er*. In short, mothers do not moth, nor are brothers more broth. The larger point is that in defining elements in words we must pay careful attention not just to sound and spelling but also to meaning. AES, pp. 32-66, "The Explication of Written Words," contains details concerning the material in this and following chapters.

2.3

Sets of Words	Free Bases
1. clearly, unclear, clearance	clear
2. repaint, painter, painted	paint
3. worded, forewords, wordy	word
4. rhythmical, rhythms, unrhythmic	rhythm

Sets of Words	Free Bases
5. changeable, changing, changes	change
6. spelling, misspell, spellers	spell
7. undoubtedly, doubts, doubtful	doubt
8. abused, misusing, usefully	use
9. performance, information, reformed	form
10. peaceful, peaceable, peacemaker	peace

2.4

Sets of Words	Bound Bases
1. invade, pervade, evades	vade
2. effective, defective, affected	fect
3. dominate, condominium, domineer	domin
4. insistence, resisted, persists	sist
5. exceedingly, succeeded, proceeds	ceed
6. exceptionally, interception, accept	cept
7. commission, dismissed, missile	miss
8. commit, admits, permit	mit
9. referee, conference, prefers	fer
10. counterfeit, forfeited, surfeit	feit

Notice that *miss* is a bound base here, even though we also have two free bases, or words, spelled <miss>, as in “We all miss Miss Smith.” The *miss* in set 7 above is not the same as either of the words spelled <miss>. The *miss* that means “to regret the absence of” is a Germanic word; it does not come from Latin. The *miss* that refers to a woman is simply a shortened form of *mistress*, which comes from Old French. The bound base *miss* in set 7 comes from a Latin word that meant “send, throw.” So the two free bases and one bound base spelled <miss> are not related to one another at all, except in their spelling and pronunciation.

2.5

Bound Bases	Languages of Origin	Etymological Meanings
1. vade	Latin	“go”
2. fect	Latin	“do”
3. domin	Latin	“be lord and master, rule”
4. sist	Latin	“cause to stand, stand”
5. ceed	Latin	“go”
6. cept	Latin	“take”

Bound Bases	Languages of Origin	Etymological Meanings
7. miss	Latin	“let go, send”
8. mit	Latin	“send, put”
9. fer	Latin	“bring, bear”
10. feit	Latin	“make”

It is no aberration that all of the words in this exercise come from Latin. Although English is a Germanic language, and Latin and French are not, English has borrowed thousands of words from Latin, either directly or by way of its descendant French. Nearly all of the bound bases in our language come from Latin or French. Many other bound bases come from Greek, especially among technical and scientific words. Surprisingly few bound bases come from the Germanic side of our language family tree.

2.6

Words with cess:	Words with cept:	Words with dict:	Words with fect:
abscess	accept	contradict	affect
excessive	deception	dictator	defective
accessed	intercepted	verdict	effect
necessary	susceptible	addicted	perfection
successful	perceptive	prediction	infected
Words with gest:	Words with ject:	Words with sist:	Words with spect:
suggest	subject	persist	inspector
gesture	adjective	consistent	circumspect
digestion	projectile	assistant	perspective
congested	conjecture	insisted	spectator
gestation	trajectory	resistant	spectacle

2.7

Plural Nouns	= Singulars	+ Suffixes
taxes	= tax	+ es
guesses	= guess	+ es
buzzes	= buzz	+ es
periods	= period	+ s
waltzes	= waltz	+ es
columns	= column	+ s
acres	= acre	+ s
strengths	= strength	+ s

Plural Nouns	= Singulars	+ Suffixes
searches	= search	+ es
brushes	= brush	+ es
squares	= square	+ s

Notice that *waltz* contains one of the very few instances in English in which <z> spells [s].

2.8.

Singular Nouns	+ Suffixes	= Plural Nouns
city + i	+ es	= cities
ego	+ s	= egos
anxiety + i	+ es	= anxieties
auxiliary + i	+ es	= auxiliaries
tomato	+ es	= tomatoes
library + i	+ es	= libraries
calendar	+ s	= calendars
try + i	+ es	= tries
toy	+ s	= toys
piano	+ s	= pianos
hero	+ es	= heroes
quantity + i	+ es	= quantities

2.9

Suffix	Meaning	Suffix	Meaning
1. -s	"more than one"	7. -est	"most"
2. -s	"3rd person, singular, present tense"	8. -ed	"past tense"
3. -s	"3rd person, singular, present tense"	9. -s	"more than one"
4. -'s	"possessive"	10. -ing	"not completed"
5. -s	"3rd person, singular, present tense"	11. -s	"more than one"
6. -er	"more"	12. -s'	"plural possessive"

Strictly speaking there are 13 inflectional suffixes in this selection: In *guys'* there are two suffixes: the plural -s and the possessive -'.

2.10

Verbs	+ Suffixes	= Nouns
amend	+ ment	= amendment
appear	+ ance	= appearance
arrange	+ ment	= arrangement
attend	+ ance	= attendance
environ	+ ment	= environment
equip	+ ment	= equipment
exhaust	+ ion	= exhaustion
govern	+ ment	= government
perform	+ ance	= performance
possess	+ ion	= possession
resist	+ ance	= resistance

2.11

Noun	+ -al, or -ful, or -ish, or -ous, or -less = Adjective	+ -ly = Adverb
accident	+ al = accidental	+ ly = accidentally
critic	+ al = critical	+ ly = critically
devil	+ ish = devilish	+ ly = devilishly
doubt	+ ful or less = doubtful, doubtless	+ ly = doubtfully, doubtlessly
fear	+ ful or less = fearful, fearless	+ ly = fearfully, fearlessly
fiend	+ ish = fiendish	+ ly = fiendishly
fool	+ ish = foolish	+ ly = foolishly
force	+ ful or less = forceful, forceless	+ ly = forcefully, forcelessly
form	+ al or less or ful = formal, formless, formful	+ ly = formally, formlessly, formfully
hope	+ ful or less = hopeful, hopeless	+ ly = hopefully, hopelessly
moment	+ ous = momentous	+ ly = momentarily
outrage	+ ous = outrageous	+ ly = outrageously

Noun	+	-al, or -ful, or -ish, or = Adjective -ous, or -less	+	-ly	= Adverb
peace	+	ful or less	= peaceful, peaceless	+	ly = peacefully, peacelessly
thank	+	ful or less	= thankful, thankless	+	ly = thankfully, thanklessly
thought	+	ful or less	= thoughtful, thoughtless	+	ly = thoughtfully, thoughtlessly
use	+	ful or less	= useful, useless	+	ly = usefully, uselessly

doubt	fear	force	form
peace	thank	thought	use

2.12

Sets of Nouns	Analyses	Definitions of Suffixes
eyelet	eye + let	"small, little"
piglet	pig + let	
booklet	book + let	
ringlet	ring + let	
heiress	heir + ess	"female, feminine"
hostess	host + ess	
countess	count + ess	
priestess	priest + ess	
handful	hand + ful	"the amount or number that will fill"
eyeful	eye + ful	
mouthful	mouth + ful	
armful	arm + ful	
spoonful	spoon + ful	
lapful	lap + ful	
childhood	child + hood	"the state, condition, or quality of being"
godhood	god + hood	
sainthood	saint + hood	

Sets of Nouns	Analyses	Definitions of Suffixes
humorist	humor + ist	"one who does, makes, operates, plays, or sells a specified thing"
terrorist	terror + ist	
motorist	motor + ist	
tourist	tour + ist	
organist	organ + ist	
journalist	journal + ist	
violinist	violin + ist	

2.13

Compound Words	Analysis into Free Stems
rattlesnake	rattle + snake
searchlight	search + light
windmill	wind + mill
handkerchief	hand + kerchief
bloodstain	blood + stain
doorknob	door + knob
darkroom	dark + room
underline	under + line
kettledrum	kettle + drum
finger nail	finger + nail
congressman	congress + man
bookkeeping	book + keeping

2.14

pro: professional	ad: 1. advertisement, 2. advantage
phone: telephone	photo: photograph
flu influenza :	burger: hamburger
bike: bicycle	ism: ism and -ism words
bra: brassiere	radio: radiotelegraphy

The *advantage* that has been clipped to *ad* is a term familiar to tennis players. It is likely that *ism* was abstracted from various words ending in *-ism* rather than from the suffix itself, especially words like *communism*, *socialism*, and *capitalism*.

2.15 analysis: Analysis is taking something apart or thinking about its parts so as to understand it better, as in analyzing a word into its elements.

element: An element is the smallest part of a written word that adds meaning to the word and is spelled consistently from one word to another. *Six* and *teen* are elements of the word *sixteen*.

syllable: A syllable is a part of a spoken word that contains one and only one sounded vowel and perhaps one or more consonant sounds. The syllables in *sixteen* are [siks] and [tēn].

base: A base is an element that can have other elements added before and after it, a word's core of meaning. Example: mean in the word meaning.

free base: A free base is a base that can stand alone as a word. Examples: cook and mother.

bound base: A bound base is a base that cannot stand alone as a word. Example: *cept* in the words *accept* and *conception*.

etymological meaning: A word's etymological meaning is the meaning of its older source word or original form. Example: "Call forth" is the etymological meaning of *provoke*.

affix: A bound element that is added to the front or back of a base or stem. In *repainted* *re-* and *-ed* are affixes.

prefix: An affix that is added to the front of a base or stem. In *repainted* *re-* is a prefix.

suffix: An affix that is added to the back of a base or stem. In *repainted* *-ed* is a suffix.

An **inflectional suffix** is a suffix that helps answer such questions as *When? Whose? One or more than one? How much?* Example: *-er* in the word *calmer*.

A **derivational suffix** is a suffix that changes and indicates a word's part of speech.

Example: *-al* in *derivational*, which changes the stem noun *derivation* into an adjective.

stem: A stem is an element or string of elements to which we are going to add or from which we are going to subtract elements. Each stem must contain at least one base. Ex: *congress* in *congressman*.

free stem: A free stem is a stem that can stand alone as a word. Examples are *predict* in *prediction* and *keeping* in *bookkeeping*.

compound word: A compound word is a word that contains at least two free stems. Example: *rattlesnake*.

3.1

Elements	Words	Changes			
		What's been inserted?	What's been deleted?	What's been replaced?	Simple Addition
ad+fix+ing	affixing			<d> by <f>	
ceil+ing	ceiling				X
change+able	changeable				X
cool+ly	coolly				X
de+cide+ion	decision		<e>	<d> by <s>	
de+lete+ed	deleted		<e>		
de+lete+ion	deletion		<e>		
dis+aster+ous	disastrous		<e>		
ex+ceed+ed	exceeded				X

Elements	Words	Changes			
		What's been inserted?	What's been deleted?	What's been replaced?	Simple Addition
ex+cept+ion	exception				X
fat+head	fathead				X
fore+head	forehead				X
in+sert+ion	insertion				X
inter+cede+s	intercedes				X
like+ly	likely				X
mis+spell	misspell				X
phys+ic+al	physical				X
picnic+ing	picnicking	<k>			
pro+fess+or	professor				X
pre+fer+ence	preference				X
re+al+ize	realize				X
re+ceive	receive				X
re+place+ment	replacement				X
re+sist+ance	resistance				X
safe+ty	safety				X
se+cret+ary	secretary				X
severe+ly	severely				X
sky+es	skies			<y> by <i>	
spell+bind+er	spellbinder				X
sub+fix	suffix			 by <f>	
super+sede	supersede				X
twin+ing	twinning	<n>			
underworld	underworld				X
verb+al+ize	verbalize				X
wish+ful+ly	wishfully				X
your+self	yourself				X

3.2:

Words	Analyses	Stems
mat <u>ting</u>	mat+t+ing	mat
mat <u>ing</u>	mat o +ing	mate
mateless	mate+less	
snip <u>py</u>	snip+p+y	snip
sniper	snip o +er	snipe
snipes	snipe+s	
slim <u>mest</u>	slim+m+est	slim
slimly	slim+ly	
slimy	slim o +y	slime
grim <u>mer</u>	grim+m+er	grim
grimness	grim+ness	
grimy	grim o +y	grime
spin <u>ner</u>	spin+n+er	spin
spinal	spin o +al	spine
spineless	spine+less	
winn <u>able</u>	win+n+able	win
winy	wine o +y	wine
winery	wine o +ery	
hatful	hat+ful	hat
hating	hat o +ing	hate
hateful	hate+ful	
fatt <u>y</u>	fat+t+y	fat
fatal	fat o +al	fate
fateful	fate+ful	

3.3

Stems	Derived and Inflected Words		
prof <u>it</u>	prof <u>it</u> ing	profite <u>er</u> ing	prof <u>it</u> able
prop <u>el</u>	prop <u>el</u> ler	prop <u>el</u> ling	prop <u>el</u> lant
regret <u>t</u>	regret <u>t</u> ing	regret <u>t</u> able	regret <u>t</u> ful
sol <u>id</u>	sol <u>id</u> ify	sol <u>id</u> ity	sol <u>id</u> arity
sym <u>bol</u>	sym <u>bol</u> ic	sym <u>bol</u> ism	sym <u>bol</u> ize

Stems	Derived and Inflected Words		
system	systemic	systematic	systemize

3.4

Stems	Derived and Inflected Words		
eavesdrop	eavesdropped	eavesdropper	eavesdropping
handicap	handicapped	handicapper	handicapping
pettifog	pettifogged	pettifogger	pettifogging
prohibit	prohibiting	prohibition	prohibitive
waterlog	waterlogged	waterlogging	waterlogs
zigzag	zigzagged	zigzagger	zigzagging

3.5

Variant Spellings	Better Fit	Reasons
kidnap <u>e</u> r	kidnap <u>e</u> rr	Fits all the criteria of the twinning rule for two-syllable stems
kidnap <u>a</u> pp <u>e</u> r		
progr <u>a</u> m <u>e</u> r	progr <u>a</u> m <u>e</u> rr	Fits all the criteria of the twinning rule for two-syllable stems
progr <u>a</u> m <u>a</u> pp <u>e</u> r		
trav <u>e</u> l <u>i</u> ng	trav <u>e</u> l <u>i</u> ng	The <e> in <i>travel</i> does not have secondary or primary stress.
trav <u>e</u> l <u>i</u> ngg		

3.6

Words with a Short Vowel		Words with a Long Vowel	
pr <u>i</u> nce	s <u>e</u> nse	pr <u>i</u> ce	sc <u>e</u> ne
val <u>e</u>	tr <u>i</u> ck <u>e</u>	val <u>e</u>	tr <u>i</u> ce
cad <u>e</u>	ap <u>e</u>	cag <u>e</u>	ap <u>e</u>
lod <u>e</u>	br <u>i</u> d <u>e</u>	lod <u>e</u>	br <u>i</u> d <u>e</u>
dun <u>e</u>	met <u>t</u> l <u>e</u>	dun <u>e</u>	met <u>e</u>
w <u>i</u> nc <u>e</u>	s <u>o</u> lv <u>e</u>	w <u>i</u> n <u>e</u>	s <u>o</u> l <u>e</u>
n <u>i</u> ch <u>e</u>	l <u>a</u> nc <u>e</u>	n <u>i</u> ch <u>e</u>	l <u>a</u> ch <u>e</u>
tw <u>i</u> ng <u>e</u>		tw <u>i</u> n <u>e</u>	

3.7

Adjectives		Verbs	
Stress Pattern	Sound of -ate	Stress Pattern	Sound of -ate
el <u>a</u> bor <u>a</u> t <u>e</u>	[it]	el <u>a</u> bor <u>a</u> t <u>e</u>	[āt]

Stress Pattern	Sound of -ate	Stress Pattern	Sound of -ate
<u>i</u> ntimate	[it]	in <u>timate</u>	[āt]
mo <u>d</u> erate	[it]	mo <u>d</u> er <u>a</u> te	[āt]
<u>a</u> lternate	[it]	<u>a</u> l <u>t</u> ern <u>a</u> te	[āt]
cert <u>i</u> fic <u>a</u> te	[it]	cert <u>i</u> fic <u>a</u> te	[āt]
de <u>g</u> enerate	[it]	de <u>g</u> ener <u>a</u> te	[āt]
sub <u>o</u> rdinate	[it]	sub <u>o</u> rd <u>i</u> nate	[āt]

3.8

Vowel Sounds		
Vowel Spellings	Short Vowels	Long Vowels
<a>	[a]	[ā]
	scrap	mate
	shad	scrape
	rat	rate
	mat	shade
<e>	[e]	[ē]
	let	see
		tree
		flee
		scheme
<i>	[i]	[ī]
	sit	lie
		tie
		site
		style
<y>		dye
<o>	[o]	[ō]
	rod	pope
	rob	cone
	pop	toe
	con	rode

	Vowel Sounds	
Vowel Spellings	Short Vowels	Long Vowels
<u>	[u]	[ū]
	sum	flute
	club	blue
	glut	glue
		sue

3.9

Group 1: Words Ending in <c>	Group 2: Words Ending in <ce>	Group 3: Words Ending in <g>	Group 4: Words Ending in <ge>
arc	choice	big	bulge
disc	dance	hag	change
garlic	fence	rug	cringe
Icelandic	fierce	swig	flange
tic	fleece		hinge
zinc	ounce		lunge
	peace		singe
	prince		tinge
	voice		voyage

How is <c> pronounced in Group 1, without silent final <e>? [k]. How is <c> pronounced in Group 2, with silent final <e>? [s]. How is <g> pronounced in Group 3? [g]. How is <g> pronounced in Group 4? [j].

3.10

Words in which <th> = [th]	Words in which <th> = [th]
loath	clothe
sheath	loathe
wrath	sheathe
teeth	teethe
length	wreathe
wreath	scythe
moth	seethe
myth	

3.11

Group 1: Words Ending in <s>	Group 2: Words Ending in <se>	Group 3: Words Ending in Other Letters
brows	browse	booze
curs	cease	bronze
dens	curse	curve
hoars	dense	give
laps	hoarse	groove
moos	lapse	have
pars	moose	plaque
pleas	parse	shelve
spars	please	statuesque
teas	sparse	thieve
tens	tease	tongue
	tense	wheeze

3.12

Group 1: Words in which Final <e> Marks or Insulates	Group 2: Words in which Final <e> Does Not Mark or Insulate	
alive	avalanche	clientele
breeze	belle	comrade
derange	bizarre	crevasse
explode	brassiere	debutante
breathe	brochure	demitasse
	cigarette	

3.13

Words in which Final <e> Marks or Insulates	Words in which Final <e> Does Not Mark or Insulate	
have	feminine	morale
judge	gazelle	nocturne
love	gazette	palette
marriage	grille	pipette
oblige	imbecile	questionnaire
peace	impasse	romaine

Words in which Final <e> Marks or Insulates	Words in which Final <e> Does Not Mark or Insulate	
plague	kitchenette	rosette
race	layette	roulette
submerge	lucerne	route
tongue	madame	statuette
zygote	medicine	troupe
	millionaire	vaudeville

3.14

Words from Middle English Verbs Ending in <i>-inen</i>	Words from Latin Nouns Ending in <i>-ina</i>	Words from Latin Adjectives Ending in <i>-inus</i>	Words from Other Sources
destine	doctrine	crystalline	bowline
examine	famine	genuine	caffeine
imagine	heroine	intestine	engine
	medicine		trampoline
	urine		turbine

3.15

Group 1: Words with Final <e> Due to the Short Word Rule		Group 2: Words with Final <e> Due to Other Reasons	
awe	one	are	gone
bye	rye	bade	none
dye	see	come	shoe
ewe	tee	done	some
eye	woe	forbade	
lye			

3.16

Words	Marking Vowels	Marking Consonants	Insulating
adze			X
bathe	X	X	
clothe	X	X	
copse			X
deluge	X	X	

Words	Marking Vowels	Marking Consonants	Insulating
dense			X
drive	X		X
engage	X	X	
freeze			X
grave	X		X
hive	X		X
huge	X	X	
lace	X	X	
lapse			X
lathe	X	X	
louse			X
moose			X
pace	X	X	
plague	X		X
prize	X		X
rampage	X	X	
range	X	X	
rogue	X		X
slave	X		X
stage	X	X	
tense			X
trace	X	X	
vague	X		X
wage	X	X	

3.17

Words	= Analyses
refereeing	= referee + ing
freest	= free + est
seer	= see + er
guaranteeing	= guarantee + ing
foreseeable	= foresee + able

3.18

Words	= Analyses
ties	= tie + s
died	= dié + ed
dying	= dīé + y + ing
pies	= pie + s

3.19

Words	= Analyses
canoed	= canoé + ed
canoeist	= canoe + ist
horseshoer	= horseshoé + er
horseshoeing	= horseshoe + ing

3.20

Words	=	Analyses
embraceable	=	embrace+able
voiceless	=	voice+less
manageable	=	manage+able
chanceful	=	chance+ful
peaceable	=	peace+able

3.21

Words	Analyses	Words	Analyses
clothing	clothé+ing	scatheful	scathe+ful
seething	seethé+ing	scythes	scythe+s
sheather	sheathé+er	breather	breathé+er

3.22

Words	Analyses	Words	Analyses
groovy	groové+y	tensor	tensé+or
hoarseness	hoarse+ness	tonguing	tongué+ing
lapsus	lapsé+us	unbelievable	unbelievé+able
leagued	leagué+ed	valvule	valvé+ule
leaguer	leagué+er	waiver	waivé+er
loving	lové+ing	wheezes	wheezé+es

Words	Analyses	Words	Analyses
oozing	oozé+ing	wheezing	wheezé+ing

3.23

Words	Analyses
imaginary	imaginé+ary
eyed	eyé+ed
eyeful	eye+ful
examination	examiné+ation
engineer	enginé+eer
torturous	torturé+ous
infinity	infinité+y
infinitely	infinite+ly
cigarettes	cigarette+s
nocturnal	nocturné+al

3.24

Words	Analyses	Words	Analyses
courageous	courage+ous	rampageous	rampage+ous
diffusible	diffusé+ible	rampages	rampage+s
easement	ease+ment	rangy	rangé+y
engaging	engagé+ing	riser	risé+er
fusion	fusé+ion	sagely	sage+ly
gracious	gracé+ious	slavishly	slavé+ish+ly
lacy	lacé+y	spacing	space+ing
outrageous	outrage+ous	vaguest	vagué+est

3.25

Words	Analyses
baker	baké+er
bribed	bribé+ed
compensatory	compensaté+ory
consumable	consumé+able
creation	créaté+ion
dividable	dividé+able

Words	Analyses
famous	famé+ous
graceful	grace+ful
graded	gradé+ed
granulose	granulé+ose
hasten	hasté+en
inscribable	inscribé+able
lifeless	life+less
likable	liké+able
mated	maté+ed
mistakable	mistaké+able
notable	noté+able
ogled	oglé+ed
polar	polé+ar
quaked	quaké+ed
rifling	riflé+ing
ripen	ripé+en
ruler	rulé+er
shaking	shaké+ing
smoking	smoké+ing
staples	staple+s
wasting	wasté+ing

3.26

Words	= Analyses
stories	= story + i + es
carries	= carry + i + es
monkeying	= monkey + ing
merrily	= merry + i + ly
trial	= try + i + al
day	= day + s
buoyed	= buoy + ed
iciest	= icy + i + est
employee	= employ + ee

Words	=	Analyses
betrayal	=	betray + al

4.1

Words	Analysis: Prefix + Stem	Before	Simple Addition	Assimilation		<m> Deletion
				Full	Partial	
concern	con+n+cern	<c>			X	
congeal	con+n+geal	<g>			X	
compound	com+pound	<p>	X			
coalition	con+alition	<a>				X
coefficient	con+efficient	<e>				X
collaborate	con+l+laborate	<l>		X		
commemorate	com+memorate	<m>	X			
correlation	con+r+relation	<r>		X		
contingency	con+n+tingency	<t>			X	
conscious	con+n+scious	<s>			X	

4.2

Word	Analysis: Prefix+Stem	Before	Simple Addition	Full Assimilation	<d> Deletion
accommodate	ad+c+com+modate	<c>		X	
addicted	ad+dicted	<d>	X		
adhesive	ad+hesive	<h>	X		
arrival	ad+r+rival	<r>		X	
affluent	ad+f+fluent	<f>		X	
advertise	ad+vertise	<v>	X		
accomplish	ad+c+complish	<c>		X	
attractive	ad+t+tractive	<t>		X	
ascension	ad+scension	<sc>			X
agnomen	ad+gnomen	<gn>			X

4.3

Word	Analysis	Description
exaggerate	ex+aggerate	Simple Addition
edit	ex+dit	<x> deletion
exception	ex+ception	Simple Addition

Word	Analysis	Description
emotion	e x +motion	<x> deletion
elaborate	e x +laborate	<x> deletion
erected	e x +rect	<x> deletion
exhibit	ex+hibit	Simple Addition
evolution	e x +volution	<x> deletion
exporter	ex+porter	Simple Addition
effort	e x +f+fort	Full Assimilation, or <x> was replaced with <f>

4.4

Word	Analysis	Description
subdivide	sub+divide	Simple Addition
succinct	su b +c+cinct	Full Assimilation, or was replaced with <c>
suffocate	su b +f+focate	Full Assimilation, or was replaced with <f>
support	su b +p+port	Full Assimilation, or was replaced with <p>
submit	sub+mit	Simple Addition
suspicion	su b +spicion	 deletion
subsidy	sub+sidy	Simple Addition

4.5

Word	Analysis	Description
syndicate	syn+dicate	Simple Addition
syllabic	sy n +l+labic	Full Assimilation, or <n> was replaced with <l>
synagogue	syn+agogue	Simple Addition
symptom	sy n +m+ptom	Partial Assimilation, or <n> was replaced with <m>
synthetic	syn+thetic	Simple Addition
synonym	syn+onym	Simple Addition
sympathy	sy n +m+pathy	Partial Assimilation, or <n> was replaced with <m>

4.6

Words with in ⁻¹ , “not”	Analyses	Words with in ⁻² , “in”	Analyses
infallible	in+fallible	instill	in+still
insanity	in+sanity	insert	in+sert
inflexible	in+flexible	inform	in+form
impatient	in+m+patient	impression	in+m+pression
illegitimate	in+l+legitimate	illuminate	in+l+luminate
irresistible	in+r+resistible	irradiate	in+r+radiate

4.7

Word	Analysis	Description
disadvantage	dis+advantage	Simple Addition
diffusion	dis+f+fusion	Full Assimilation, or <s> is replaced with <f>
disorganized	dis+organized	Simple Addition
digression	dis+gression	<s> deletion
diffidence	dis+f+fidence	Full Assimilation, or <s> is replaced with <f>
dilation	dis+l+ation	<s> deletion
disjointed	dis+jointed	Simple Addition
divorce	dis+vorce	<s> deletion
discord	dis+cord	Simple Addition
dirigible	dis+r+igible	<s> deletion

4.8

Word	Analysis
admonition	ad+mon+ition
ammunition	ad+m+mun/ition
apparition	ad+p+par+ition
attrition	ad+t+trite+ion
audition	aud/i+it+ion
coalition	com+al+ition
cognition	cogn+ition
condition	com+n+dite+ion
contrition	com+n+trite+ion

Word	Analysis
demolition	de+mol+ition
disposition	dis+posé+it+ion
ebullition	ebullī+ition
erudition	ex+rudē+ité+ion
exposition	ex+posé+it+ion
extradition	extra+dité+ion
fruition	fruit+ion
imposition	im+posé+it+ion
inhibition	in+hibit+ion
inquisition	< in+quis+ité+ion
partition	part+ité+ion
petition	petē+ition
premonition	pre+mon+ition
preposition	pre+posé+it+ion
prohibition	pro+hibit+ion
proposition	pro+posé+it+ion
repetition	re+petē+ition
requisition	re+quis+ité+ion
sedition	sed+it+ion
supposition	sub+p+posé+it+ion
tradition	tra+dité+ion
volition	volit+ion

4.9

Sets	Verbs	Nouns in -ion
{ceive, cept}	conceive	conception
{ceive, cept}	deceive	deception
{mit, miss}	commit	commission
{mit, miss}	omit	omission
{mit, miss}	emit	emission
{mit, miss}	intermit	intermission
{mit, miss}	remit	remission
{mit, miss}	submit	submission

Sets	Verbs	Nouns in -ion
{scribe, script}	ascribe	ascription
{scribe, script}	prescribe	prescription
{sume, sumpt}	presume	presumption
{sume, sumpt}	resume	resumption
{tain, tent ² }	abstain	abstention
{tend, tent ¹ }	distend	distention

4.10

Words Ending in <tion>		Words in <sion> and <ssion>
abbreviation	description	compulsion
action	detention	discussion
attention	distortion	tension
competition	exhibition	omission
completion	exhilaration	succession
composition	opposition	suspension
deception	organization	

In words ending in [shən] spelled 'tion' what letters precede the <t>? <a>, <c>, <n>, <i>, <e>, <p>, and <r>. In words ending in [shən] spelled <ssion> what letters precede the <ss>? <e>, <i>, and <u>. In words ending in [shən] spelled <sion> what precedes the <s>? <n>

4.11

Nouns	[shən] or [zhən]	Nouns	[shən] or [zhən]
distension	[shən]	prevention	[shən]
diversion	[zhən]	precision	[zhən]
donation	[shən]	retrogression	[shən]
erosion	[zhən]	revision	[zhən]
eviction	[shən]	session	[shən]
exertion	[shən]	suspicion	[shən]
explosion	[zhən]	submersion	[zhən]

4.12

Adjectives	Nouns	Adjectives	Nouns
gr <u>ave</u>	gr <u>av</u> ity	re <u>al</u>	re <u>al</u> ity
int <u>ense</u>	int <u>ens</u> ity	ser <u>ene</u>	ser <u>en</u> ity

Adjectives	Nouns	Adjectives	Nouns
lib <u>e</u> ral	lib <u>e</u> ral <u>i</u> ty	subl <u>i</u> me	subl <u>i</u> mit <u>y</u>

In the nouns are the vowels immediately preceding the -ity long, or are they short?
short .

4.13

Nouns	Analyses	Nouns	Analyses
fer <u>o</u> city	feroc+ity	l <u>e</u> vity	lev+ity
fid <u>e</u> lity	fidel+ity	vel <u>o</u> city	veloc+ity
friv <u>o</u> lity	frivol+ity	vic <u>i</u> nity	vicin+ity

In the nouns are the vowels immediately preceding the -ity long, or are they short?
short .

4.14

Nouns	Adjectives	Nouns	Adjectives
mel <u>o</u> dy	mel <u>o</u> dic	o <u>o</u> rgan	organ <u>i</u> c
m <u>i</u> me	m <u>i</u> mic	te <u>l</u> escope	telescop <u>i</u> c
o <u>o</u> cean	ocean <u>i</u> c	ton <u>e</u>	ton <u>i</u> c

In the adjectives are the vowels immediately preceding the -ic long, or are they short?
short .

4.15

Shorter Words	Longer Words	Third Vowel?	Short?	Shorter Words	Longer Words	Third Vowel?	Short?
gene	g <u>e</u> neral	X	X	supreme	suprem <u>e</u> acy	X	X
grade	gr <u>a</u> du <u>a</u> l	X	X	precede	pre <u>e</u> cedence	X	X
grain	gr <u>a</u> nu <u>a</u> l	X	X	sacred	sacr <u>i</u> lege	X	X
rite	ri <u>t</u> ual	X	X	site	sit <u>i</u> uate	X	X
solo	sol <u>i</u> tude	X	X	compete	comp <u>e</u> titor	X	X

4.16

agate X
agent
gofer
govern X

pedal X
pekoe
menace X
mesa

medal X
clamor X
laden
penance X

crevice X
private
crisis
value X

5.1 Words with [t] spelled . . .

<t>		<tt> due to . . .			
		Twining	Assimilation	Simple Addition	VCC or VCCle
attainments	stifle	committee	attainments	cattails	cattle
attempted	streams	fattest	attempted	out take	ditto
exempt	tattoo	quitting	inattention	outricked	lettuce
fattest	tomato	regretted	unattached	ratrap	tattoo

The two words with [t] spelled <ed> are outricked and unattached.

5.2 Words with [k] spelled . . .

<c>		<k>		<ck>	
consequence	picnickers	breakfast	provoke	chuckle	picnickers
o'clock	scientific	hawk	remarks	knocking	schlock
picnic	zodiac	kitchen	skunk	o'clock	wrecker

<cc>	<ch>	<q>	<qu>	<lk>
according	Christmas	consequence	antique	chalky
occasion	school	quantity	liquor	folksy
succumb	technology	squirrel	mosquito	walking

5.3 Words with [f] spelled . . .

<f>		<ff> due to . . .			<ph> or <gh>
		Assimilation	Twining	VCC or VCCle	
certify	fluorescent	effective	iffy	buffalo	coughing
counterfeit	friendly	efficient		coffee	elephant
fascinate	shelf	indifferent		waffle	paragraph

5.4 Words with [ch] spelled . . .

<ch>		<tch>	<t>	
achieve	purchase	kitchen	actual	questions
church	spinach	watchful	fortune	statue
mischief	teacher	wretched	nature	suggestion

5.5 Words with [n] spelled . . .

<n>		<nn> due to . . .			
		Twining	Assimilation	Simple Addition	The VCC Pattern
cinnamon	innocent	beginner	annihilate	cannot	cinnamon
columnist	nuisance	skinniest	connection	innocent	minnow
connection	unannounced	twining	unannounced	unnecessary	tennis

The word with [n] spelled <gn> is resigned.

5.6 Words with [r] spelled . . .

<r>		<rr>		<wr>	<rh>
acquire	referred	arrival	referred	rewritten	rhinoceros
breathe	rewritten	corrected	surrounded	wrapping	rhyme
interpretation	rhinoceros	interrupt	terrify	wrong	rhythm

5.7 Words with [w] spelled . . .

<w>		<u>		<wh>
dwelling	toward	language	quick	awhile
rewards	twisted	misquoted	require	nowhere
swimmer	woman	persuade	square	whales

5.8 Words with the short vowel . . .

[a]	[e]	[ɪ]	[o]	[u]	[ʊ]
scratch	yellow	sister	bottle	someday	could
apples	question	bridge	soft	touch	good
laughed	threaten	rhythm	taught	number	bull

5.9 Words with the long vowel . . .

[ā]	[ē]	[ī]	[ō]	[ū]	[yū]
station	believe	height	bowled	whose	used
favor	teachers	while	those	school	music
eight	she	typed	boast	rules	cube

5.10 Words with . . .

instances of the <l> before <e> rule			holdouts to the rule
achieve	lies	receive	counterfeit
ceiling	neighbor	seismic	fiery

instances of the <l> before <e> rule			holdouts to the rule
height	pie	shriek	foreign
hygiene	piece	weigh	hierarchy

5.11 Words with . . .

[oi] spelled . . .			[ou] spelled . . .		
<oy>	<oi>		<ow>	<ou>	
annoy	adjoin	moisture	allow	grouch	ours
employ	appoint	ointment	vowel	blouse	gouge
destroy	choice	oily	clown	devout	doubt

5.12

Original Word	Shortened Form	Correct Spelling of Original Word
confédant	confide	confident
distèllation	distill	distillation
mèniacal	maniac	maniacal
telegraphy	telegraph	telegraphy
negətive	negate	negative
læborious	labor	laborious
accommedate	commode	accommodate
illustrətive	illustrate	illustrative
drematic	drama	dramatic
osteopəthy	osteopath	osteopathy

5.13

Original Word	Lengthened Form	Correct Spelling of the Original Word
arəd	aridity	arid
prejudəce	prejudicial	prejudice
facəle	facilitate	facile
flaccəd	flaccidity	flaccid
finəl	finality	final
residənt	residential	resident
punctuəl	punctuality	punctual

Original Word	Lengthened Form	Correct Spelling of the Original Word
geniəl	geniality	genial
periəd	periodic	period
sterəl	sterility	sterile
neutrəl	neutrality	neutral

5.14

Original Word	Replacement	Stress-shifted Word	Correct Spelling
ənalýsis	lyze for lysis	analyze	analysis
psychəlogical	-y for -ical	psychology	psychological
barbərəus	-ian for -ous	barbarian	barbarous
bibliogrəphy	-ic for -y	bibliographic	bibliography
cənsərvətism	-ion for -ism	conservation	conservatism
pragmətism	-ic for -ism	pragmatic	pragmatism
existənce	-ential for -ence	existential	existence