
Word Smarts

Using Morphology (Bases & Affixes) To Develop Vocabulary Skills

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I. Introduction

- a. word knowledge & active vs. passive vocabulary
- b. motivation for teaching morphology
- c. terminology
- d. Anglo-Saxon, Latin, Greek: sorting by origin

II. First Level Morphology

- a. Anglo-Saxon base words & affixes
- b. basic parts of speech for suffixing

III. Second Level Morphology - Latinate Words

- a. Latin bases and affixes
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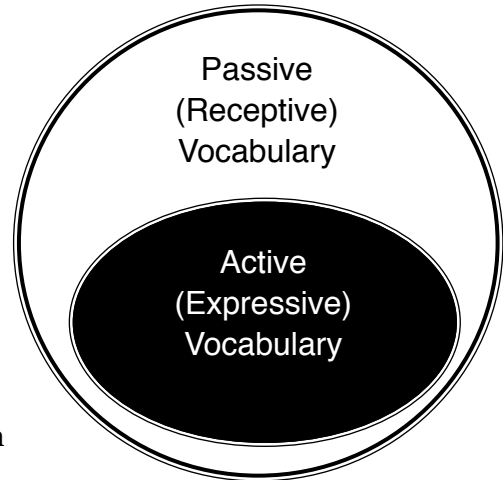
- a. Greek template
- b. Greek combining forms

Different Kinds of Vocabulary & Levels of Word Knowledge

Passive & Active Vocabulary:

A person's **active** (expressive) vocabulary is a smaller subset of her **passive** (receptive) vocabulary; in other words, she knows far more words than she uses.

Of the approximately 175,000 words in current use—750,000 if you take into account polysemy (multiple meanings)—a typical college-educated adult has a vocabulary of about 40,000 words, uses about 20,000 when she writes, and uses only about 10,000 of that 20,000 when she speaks.



Instructors should choose vocabulary words carefully. Also, if a student needs only to *recognize* a word in text, instruction can be less intense. If a student needs to be able to *use* the word, instruction will need to include a deeper understanding and application practice.

Word Knowledge:

Before teaching a word to students, show them the word and ask them to rank it on a scale of 1 to 5 by how well they know it. This activates any prior knowledge of the word.



Vocabulary Categories:

Reading vocabulary:

words you recognize when you read (typically the largest vocabulary)

Listening vocabulary:

words you recognize when listening to speech (increased by context and tone of voice)

Writing vocabulary:

words you use when you write (many written words do not usually occur in speech)

Speaking vocabulary:

words you use in speech (typically a subset of listening vocabulary)

Notes:

Terminology for Morphology Study

<u>affix</u>	prefix or suffix that can be attached to the base
<u>base</u>	morpheme that holds the core meaning of a word; every word has one stands alone; often called base word (e.g., <u>port</u> , <u>kind</u>)
<i>free base</i>	only appears as part of a larger word (e.g., <u>struct</u> , <u>mit</u>)
<i>bound base</i>	
<u>base word</u>	free base; word even when no affixes are added (e.g., <u>kind</u>)
<u>final stable syllable</u>	cluster of letters at the end of a word whose pronunciation remains consistent regardless of the word in which it appears (e.g., <u>-tion</u> , <u>-ble</u> , <u>-ture</u>); <i>not</i> synonymous with the term suffix
<u>morpheme</u>	smallest component of a word that has meaning
<u>phoneme</u>	smallest unit of speech sound (e.g., /b/, /ch/)
<u>prefix</u>	affix placed before the base of a word (e.g., <u>pre-</u> , <u>ab-</u>)
<u>root</u>	word in an origin language from which English bases are derived; (sometimes, the term is used to identify bases)
<u>suffix</u>	affix placed after the base of a word
<i>derivational (lexical):</i> (shifts part of speech)	vowel: -able, -ance, -ate, -er (noun), -ish, -ive, -ize, -ous, -us consonant: -ly, -like, -ment, -ful, -tude, -less
<i>inflectional (grammatical):</i> (does not shift part of speech)	vowel: -ed, -er (comparative), -es, -est, -ing consonant: -ly, -'s, -s
<u>assimilated prefix</u>	prefix (often nicknamed chameleon) where, for ease of pronunciation, the final letter changes according to the initial letter of the base to which it is attached (e.g., <u>ad-</u> changes to <u>ar-</u> before <u>range</u> to make <u>arrange</u> ; <u>in-</u> changes to <u>im-</u> before <u>pact</u> to make <u>impact</u>)
<u>element</u>	(sometimes called combining form) often used to describe Greek-based bases and affixes (e.g., <u>phone</u> , <u>crat</u> , <u>phys</u> , <u>epi-</u> , <u>a-</u>)
<u>connective</u>	letter(s) in English words used to combine two morphemes; connectives function as glue and have no meaning (not morphemes)
<i>Latin-based</i>	connect a base to a suffix or two suffixes to each other (e.g., <u>palim</u> ony, <u>grad</u> ient, <u>monu</u> ment). <u>-i-</u> and <u>-u-</u> are connectives; while <u>-ul-</u> is sometimes identified as a connective, it is actually suffix <u>-ule</u> , where the <u>e</u> has dropped before a vowel suffix
<i>Greek-based</i>	connective <u>-o-</u> often joins two elements (e.g., <u>photo</u> graph, <u>demo</u> cracy)

note: Because in linguistics the term "root" refers to the word (in another language) from which our current stem or base is derived, base is a more clear term to describe the core meaning in an English word. Often, however, in word study with students, the term "root" is used interchangeably with "stem" and "base."

Selecting Word Origins

Label each word as AS = Anglo-Saxon; G = Greek; or L = Latin

sing	surreptitious	regenerate	hundred
mutual	what	phase	evacuate
monochrome	telepathy	those	phonics
forty	from	abbreviate	incredulous
declension	manuscript	phonograph	moat
pyre	pathology	epidemic	recuperate
expenditure	does	miss	
laugh	white	abnormal	<i>bonus words:</i>
orchid	biology	contraception	biodegradable
distribute	consequence	elbow	graphomotor
psychology	watch	philanthropist	subatomic

Identifying Morphemes

Underline the base words. Box the affixes (prefixes and suffixes).

cook	overheated	unworthy
cooking	sunset	worthlessness
overcooked	like	worthiest
heat	likely	understandable
heating	liking	underactive
heater	likelihood	hopefully
preheat	worth	unwholesome

Suffixes Both Determine & Change Part of Speech

noun	verb	adjective	adverb
joy	rejoice(s,ing,ed) enjoy(s,ing,ed)	joyous joyful	joyfully
peace		peaceful	peacefully
hunger	hunger(s) hungered hungering	hungry	hungrily
expanse expansion expansiveness	expand(s) expanding expanded	expansive expandable	expansively
darkness dark	darken(s) darkened darkening	dark darker darkest	darkly
act action actor	act(s) acted acting	active	actively
loudness	-	loud louder loudest	loudly
dependence	depend(s) depended depending	dependent dependable	dependently
sleep sleeper sleepiness	sleep(s)	sleepy	sleepily

Note: -ed and -ing verbs can also serve as adjectives (called participles).

Morpheme Instruction at the Middle & High School Level: A Week's Lesson in E.L.A.

1. Introduce.
 - a. Write the morpheme for students to see. Include appropriate dashes for affixes. (e.g., pre-, contra-, -ment, -age *but* port-, struct)
 - b. Have students trace and write the morpheme, naming its letters as they write.
 - c. Write the morpheme in a keyword to show how it is used.
 - d. Have students pronounce, trace, and write the keyword, naming its letters as they write.
 - e. Explain and write the meaning of the morpheme. (Either use direct instruction or, wherever possible, help students use discovery learning to uncover its meaning.)
 - f. Provide or ask students to create a personal card with the morpheme on the front and its keyword and meaning on the back.
 - g. Using a Post-it, add the morpheme to the morpheme wall or chart.
2. Generate with the students a list of words that contain the new morpheme.
3. Provide definitions, and have students retrieve from memory other, recognizable but less familiar, words that contain the studied morpheme.
4. Have students build a matrix for the morpheme or build word sums from an existing matrix.
5. Have students locate and underline the morpheme in words containing it. Alternatively, have the students complete word sorts.
6. Have students participate in morphemic awareness activities (oral manipulation of morphemes in words). Use felts or chips to represent the morphemes you move just as you would for phonemic awareness activities. (See Donah's texts for scripted activities.)

Instructor: Say constructed.

Student: constructed

Instructor: Change the /ed/ in constructed to /ing/.

Student: constructing

Instructor: Add re to the beginning of constructing.

Student: reconstructing

Instructor: Drop the first prefix and the /ing/ in reconstructing.

Student: construct

Instructor: Add /iv/ to the end of construct.

Student: constructive.

7. Have students read phrases/sentences that include examples of words containing morpheme.
8. Provide word, phrase, and sentence dictation that includes examples of words containing morpheme.
9. Have students write sentences with words containing morpheme.
10. Have students locate words that contain familiar prefixes and bases in paragraphs or longer pieces.

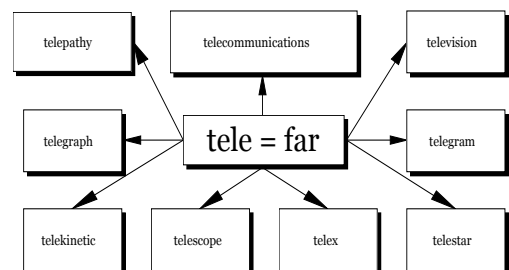
* *Games and other activities can be added or even used instead of some of the activities above. See separate page of supplemental activities.*

Morpheme Instruction for Middle/High School Students In the Content Areas

1. Introduce.
 - a. Write the morpheme for students to see. Include appropriate dashes for affixes. (e.g., pre-, contra-, -ment, -age *but* port, struct)
 - b. Have students write the morpheme, naming its letters as they write.
 - c. Write the morpheme in a keyword to show how it is used. (You choose the keyword.)
 - d. Have students pronounce and write the keyword, naming its letters as they write.
 - e. Explain and write the meaning of the morpheme. (Either use direct instruction or, wherever possible, help students use discovery learning to uncover its meaning.)
 - f. Ask students to make a morpheme card for the term or, alternatively, to add it to the vocabulary section of their notebooks.
 - g. Using a Post-it, add the morpheme to the morpheme wall.
2. Generate with the students a list of words that contain the new morpheme.
3. Provide definitions, and have students retrieve from memory other, recognizable but less familiar, words that contain the studied element.
4. Have students build a matrix for the morpheme.
5. Have students locate and underline the morpheme in words containing it. Alternatively, have the students complete word sorts.
6. Have students read sentences/paragraphs that include examples of words containing element. (This could involve reading the textbook or an article or essay that uses this morpheme.)
7. If you want the term in their active vocabulary, ask students to write sentences with words containing element. A sentence frame may help with this activity.

Bonus Activities:

- A. Have students write a prefix or base in the center, and map or web words that come from that word part. More advanced students can even link those webbed words to other prefixes and base. An example of a simple word web for the Greek element tele is at right.
- B. #6 can be done as a cumulative activity, where students identify words that include any studied element from the year. This practice teaches students to recognize learned word parts and proves their frequency and therefore the usefulness of studying them.



A Note on Procedure for Word Origins

A significant conceptual difference exists between basic phonological decoding (division by sound) and morphological work (division by meaning).

With morphology we no longer examine words based on syllabication; rather, we examine them based on parts for meaning. Examples are above at right. Morphological study leads to an understanding of more challenging spellings and an enhanced vocabulary.

phonological division	morphological division
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e la tion	e lat ion
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in som ni a	in somn i a
-------------	-------------

con tra dic tion	contra dict ion
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Recall & Recognition Drills (taken from Shirley A. Kokesh)

After a concept has been taught, it must be drilled if it is to be remembered. Drills are on two levels:

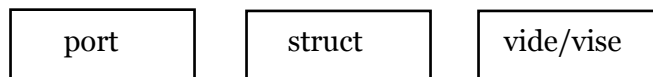
1. Recognition: Instructor provides a set of potential answers and one question.
Student must choose the correct answer from the given set.
2. Recall: Instructor provides one question.
Student must provide the answer from memory.

A great deal of student failure occurs because teachers tend to go from teaching directly to the higher level drill of recall....or testing! While a small percentage of students can function well in such a system, it places most in a position of threat, uncertainty, and insecurity. If students fail, many times the instructor repeats the procedure instead of adding necessary lower level drills of recognition.

For example: After explaining the meanings of three to six morphemes (teaching), if you then say, "Now let's go through these morphemes again, only this time you tell me the definitions," you are testing (recall) not practicing (recognition).

Instead, after teaching the meanings of several new bases or prefixes, insert the following recognition drill:

1. Put three of the word part cards in front of the student:



2. Define one of these bases: "build"
3. The student "recognizes" the base he thinks is right by tapping or removing it, spelling "s-t-r-u-c-t."
4. The teacher places a new card on top of, or in place of, struct and gives the second definition of the drill.
5. If the student chooses the wrong answer, say, "Try again!" Don't display a new card. Rather, define the word that was mistaken so that the student can get immediate feedback to correct his error.
6. When all cards have been drilled, then it is appropriate to go to the testing level (recall). Gather cards in a deck. Flash and test: "Give me the definitions for each card you see."

Sample Activity: Sister Words for Shared Meaning

challenge	sister word	shared meaning
perturbed	disturb	-----
benefactor	benefit	-----
rupture	disrupt	-----
amiable amicable	amigo	-----
envision	vision	-----
enclosure	close	-----
antibiotic	antisocial biology	----- -----
autobiography	automobile biology paragraph	----- ----- -----
euphony euthanasia	euphemism eulogy	----- -----
geothermal	geography Thermos	----- -----

Sample Activity: Identifying Morphemes

Underline bases, circle connectives, and box affixes.

Latin structure

confide

eruption

counterproposal

regenerative

Greek structure

psychometrics

photographic

synchronize

sympathetic

Sample Activity: Using Matrices for Word Building

de re	con	struct "build"	ible			<i>structure</i>
in	de		ing			
in ob			ion	or		
		s	al	ly		
		ure	ed			
			ing			
			s			

Sample Activity: Sort Words by Common Morpheme

benevolent	compelling	benefactor	pedal
pedometer	polygamy	compulsory	impulsivity
polyester	expedient	polygon	beneficial
repulsive	benign	impediment	polyglot

pede

poly

bene

pel/pulse

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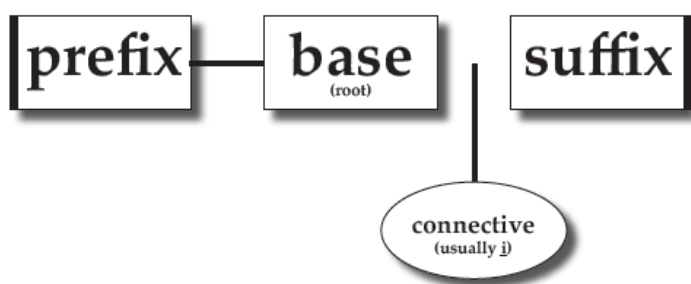
Sample Activity: Continuum Vocabulary

angry	irascible	smart	shrewd
raging	infuriated	intelligent	insightful
wild	enraged	clever	brainy
tempestuous	irate	fast	wise
wrathful	provoked	sharp	bright
furious	aggravated	astute	brilliant
mad	livid		
huffy	indignant		
hot under the collar	outraged		

Latin Connectives Practice Sheet

Underline bases, circle connectives, and box affixes.

expedient	spatula
muscular	alleviate
petunia	testimony
magnitude	impediment
virtuous	imperial
continual	egregious
gratify	radiant
hysteria	unofficial
spectacular	appreciate
monument	editorial
cautious	malicious
deficiency	exponential
popular	suburbia
evaluate	injurious
tempestuous	parsimonious
brilliant	marsupial



Three key Latin connectives are i, u, and ul. Be aware that connective ul is actually suffix ule, where the e has dropped before a vowel suffix. You should accent the syllable that comes before the Latin connective:

sól i tude món u ment rég ul ate

u and ul are always long:

promiscuuous manuul musculur

Latin connective i is by far the most common.

Use these rules for pronouncing it:

1. i = /ē/ before a vowel suffix: curious
2. i = /y/ after l or n: peculiar
3. i = /ĩ/ before a consonant: multitude

A sampling of useful suffix rules:

-ous = adjective -ate /āt/ = verb
 -us = noun -ate /ět/ = adj./noun

*Note: The word lists accompanying these morphemes were developed for **high school** students. Some words should be omitted for younger students.*

Morphemes in the Content Areas: Content-area instructors have the opportunity to show how morphemes function in words specific to their subject. Exploring words' common morphemes and shared meanings proves fruitful for vocabulary development—to help students understand both words instructors are teaching and those that may be encountered in the future.

gen/gene - birth, origin (common science morpheme)

androgen	eugenics	genitals	hypoallergenic
allogenic	genealogy	genius	neurodegenerative
biogenesis	general	genteel	overgeneralize
biogenetic	generalize	gentle	oxygen
carcinogen	generate	gentleman	pathogen
congenital	generative	gentry	photogenic
congenitally	genetic	genus	primogenitor
degenerate	geneticist	heterogeneous	regenerate
eugenicist	genial	homogeneous	transgenerational
estrogen	genitalia	hydrogen	

crat/cracy - rule or government by (common history morpheme)

aristocracies	isocracy
aristocrat	meritocracy
aristocratic	mobocracy
autocrat	nondemocratic
bureaucrat	technocrat
bureaucracy	theocracy
bureaucratic	theocrat
democracy	undemocratically
democrat	

arch - chief/principal (common history morpheme)

anarchy	monarch
anarchism	monarchies
archbishop	monarchy
archdiocese	nonhierarchical
hierarchical	oligarchy
hierarchy	patriarch
matriarch	patriarchal
matriarchal	patriarchy
matriarchy	tetrarchy

Common Morphemes (William Van Cleave compilation - from *Everything* text)

morpheme	meaning	sample word
Anglo-Saxon Prefixes		
a-	on, in	across
for-	away, against	forbid
fore-	before, ahead	forehead
mis-	wrong(ly)	mistake
out-	beyond	outlaw
un-	not	unhappy
under-	below	underrate
Anglo-Saxon Suffixes		
-ed	past tense	jumped
-ly	adverb	likely
-ful	quantity noun	spoonful
	adjective	doubtful
-ful + -ly	adverb	hopefully
-less	adjective	worthless
-ness	noun	darkness
-ing	verb	digging
-er	comparative adj.	greater
-est	superlative adj.	greatest
-ish	adjective	brownish
	verb	furnish
-hood	noun	adulthood

morpheme	meaning	sample word
Latin Prefixes		
ab-, abs-	away from	absent
circum-	around	circumference
contra-counter-		
	against	contradict
de-	down from,	descend
	concerning	
extra-	beyond	extraordinary
inter-	among, between	interrupt
multi-	many	multimillionaire
per-	through	perforate
	completely	perfect
post-	after	postpone
pre-	before	preview
pro-	for, forth	proceed
re-	again	recopy
	back	reject
se-	apart from	separate
super-	over	supervise
trans-	across	transport

Assimilated Latin Prefixes

Often, instructors teach the core prefix (e.g., ex-) early on, returning later to add its assimilations when students are ready.

ex- (e-, ef-)	out of	exit
dis- (di-, dif-)	apart	distant
	not	dissatisfied
ad- (ac-, af-, ag-, al-, an-, ap-, ar-, as-, at-)	to, toward, at	advance
ob- (oc-, of-, op-)	object	against
sub- (suc-, suf-, sup-)		
	under	submarine
con- (com-, col-, cor-)		
	with, together	construct
in- (im-, il-, ir-)	in	invade
	not	insane

Common Morphemes (William Van Cleave compilation - from *Everything* text)

morpheme	meaning	sample word
Latin Bases		
<i>transparent</i>		
aud	hear	audio
dice, dict	say	dictate
ject	throw	eject
mise, miss, mit	send	mission
mobe, mote, move	move	move
pel, pulse	push	expel
port	carry	portable
rupt	break	interrupt
scribe, script	write	script
spece, spect, spice	see	spectacles
tract	drag, pull	tractor
vide, vise	see	video
<i>main list</i>		
cape, capt, ceive, cept, cipe	take	capture
cede, cess	go, yield	recede
cide, cise	cut, kill	scissors
claim, clame	call out	exclaim
clause, close, clude,	close, shut	closet
cluse		
crede	believe	credit
course, cur, curse	run	current
duce, duct	lead	educate
face, fact, fect, fice	make	factory
feder, fide	trust	federal
fer	carry	refer
fine	end, limit	finish
flect, flex	bend	flexible
form	form	form
gene, gener	birth, origin	gene
grade, gress	walk, step,	progress
	move	
lect, lege, lige	choose,	elect
	speak, read	
pede	foot	pedal
pend, pense	hang, weigh	pendulum
plice, ply	fold	reply

morpheme	meaning	sample word
pone, pose, pound	put, place	position
press	press	press
quest, quire, quise	ask, seek	question
sede, side, sess	sit	residence
sense, sent	sense, feel	sensitive
sist, stance, stant,	stable	stand
state, stite		
spire	breathe	inspire
struct	build	structure
tain, tene, tine	hold	container
tend, tense, tent	stretch,	tension
	strain	
vail, vale	be strong,	value
	power	
vene, vent	come	convention
verse, vert	turn	invert
vite, vive	live	survive
voce, voke	call	vocal

There are a number of Greek morphemes worth learning though Greek bases and affixes typically appear in more specialized vocabulary.

Of the many Greek morphemes, graph, gram, which means write, is particularly common and worth teaching first. Others can be found in the *Everything* text.

Science Morphemes (Ron Yoshimoto compilation)

morpheme	meaning	sample word	morpheme	meaning	sample word
aero	air	aerobes	enter	intestine	gastroenteritis
amphi	both	amphibian	entom	insect	entomology
angio	vessel	angiogram	epi	upon/on	epidermis
antho	flower	another	erg	work	ergonomics
anti	against	antibody	exo	out	exotoxin
arthro	joint	arthritis	ferro	iron	ferrite
astro	star	astronomy	fiss	split	fission
atmo	vapor	atmosphere	gastro	stomach	gastropods
atom (a+tom)	indivisible	atomic	gen	origin	genetics
aud/audi	hear	audiometer	geo	earth	geology
aur	gold	Aurora	germ	related/vital	germinate
auto	self	autotrophic	gest	carry	digestion
baro	pressure	barometer	glyc	sweet	glycerin
bath	deep	bathyscaph	gram/graph	write	seismograph
bio	life	biological	grav	heavy	gravity
blasto	embryo	blastocyst	gyn	female	gynecology
brachio	arm	brachium	gymno	naked	gymnosperm
branchio	gills	branchia	gyro	turn	gyroscope
bronch	windpipe	bronchial	helio	sun	heliotropic
calor	heat	caloric	hema/hemo	blood	hemoglobin
cardi/cardio	heart	cardiogram	hepat	liver	hepatitis
carn	meat/flesh	carnivore	hetero	different	heteromorphic
cephalo	head	cephalopod	hibern	winter	hibernation
chlor	green	chlorophyll	hist	tissue	histology
chrom	color	chromosome	homo	same	homozygous
chron	time	chronometer	hydro/hydra	water	hydrometer
coel	hollow	coelenterates	hyper	over	hyperacidity
corp	body	corpuscle	ichthy	fish	ichthyologist
cosmo	universe/world	microcosm	ign	fire	igneous
cranio	skull	intracranial	infra	beneath	infrared
cyan	blue	cyanide	intra	within	intracellular
cyclo	circle	cyclotron	ite	mineral	granite
cyt	cell	cyclotron	itis	inflammation	appendicitis
dendr	tree	dendrite	ium	element	radium
derm	skin	dermatology	kine	motion	kinetic
diplo	double	diplococcus	lepsy	attack	epilepsy
dorm	sleep	dormancy	leuko/leuc	white	leukemia
dors	back	dorsal	lign	mineral/fossil	halite
dyna	power	dynamite	lith	rock	lithium
dys	bad	dysentery	luc/lum	light	lumen
echin	spiny	echinodermata	luna	moon	lunar
eco	house	ecology	lys	breakdown	dialysis
ecto	outer	ectoplasm	macro	large	macrobiotics
endo	within	endoplasm	mal	bad	malignant

morpheme	meaning	sample word	morpheme	meaning	sample word
mar	sea	marine	pter	wing	pterodactyl
melano	black	melanoma	pyro	fire	pyrotechnic
meta	change	metamorphosis	radi	ray	radiation
meter	measure	millimeter	rhiz	root	rhizome
micro	small	microscope	rhodo	rose	rhododendron
moll	soft	mollusk	saur	lizard	dinosaur
morph	shape	metamorphosis	scope	see	microscope
mut	change	mutation	sect	cut	dissection
myo	muscle	myocardium	sphere	ball	hydrosphere
neo	new	neonatal	sol	sun	solar
neuro	nerve	neurology	solv	loosen	solvent
nuc	center	nucleus	som	body	somatic
ocul	eye	ocular	sperm	seed	spermatophyte
oid	appearance	asteroid	spir(e)	breathe	respiration
ology	study of	dermatology	spor(e)	seed	sporophyte
oma	tumor	carcinoma	stell	star	interstellar
omni	all	omnivore	stereo	solid	stereoscope
ophthal	eye	ophthalmology	strat	layer	stratosphere
ornith	bird	ornithology	sub	below	substratum
oscu	mouth	osculum	sym/syn	with/together	symbiosis
ose	sugar	glucose	taxis	arrangement	taxonomy
osis	condition	osmosis	tele	far	telescope
osteo	bone	osteopath	therm	heat	thermometer
ov/ovi	egg	oviduct	tomy	cut	anatomy
patho	disease	pathogen	tox	poison	toxins
ped/pod	foot	bipeds	trich	hair	trichinosis
petr	rock	petroglyph	troph	turn	troposphere
phag	eat	phagocyte	troph	nourishment	autotrophic
phasia	speech	aphasia	ultra	beyond	ultraviolet
phen	appearance	phenotype	vac	empty	vacuole
phono	sound	phonon	vas	vessel	vascular
phor	carry	chromatophore	vect	carry	convection
photo	light	photosynthesis	ventri	belly	ventral
phyll	leaf	chlorophyll	vermin	worm	vermin
phylo	kind	phylum	vert	turn	vertebra
physi	nature	physics	viv/vita	life	vitamin
phyte	plant	saprophyte	volcan/	fire	volcano
plasm	form	cytoplasm	vulcan		
plasto	molded	plastid	volv	roll	revolution
platy	flat	platypus	vore	eat	herbivore
pneumo	lung	pneumonia	xylo	wood	xylem
prim	first	primate	zo(o)	animal	zoology
proto	first	protoplasm	zygo	yoke	zygote
pseudo	false	pseudopod	zym	ferment	enzyme

Math Morphemes (Ron Yoshimoto compilation)

morpheme	meaning	sample word	morpheme	meaning	sample word
alt	high	altitude	nom	name	denominator
circum	around	circumference	numer	number	numerator
col/com/con	with/together	collinear	oid	resembling	trapezoid
de	down/away	denominator	para	beside	parabola
dia	across	diagonal	pend	hang	perpendicular
digit	finger	digital	peri	around	perimeter
equi	equal	equilateral	ply/plic	fold	multiply
fer	bring/carry	circumference	put(e)	think	compute
fract	break	fraction	radi	ray	radius
gon	angle	polygon	rect	right/straight	rectangle
grade	step	centigrade	sect	cut/divide	bisect
gram/graph	write	kilogram	sphere	ball	spherical
hedron	sided object	tetrahedron	sub	below/under	subtract
hypo	under	hypotenuse	sym/syn/syl	with/together	symmetric
inter	between/ among	intersect	tang	touch	tangent
iso	equal	isosceles	therm	heat	thermometer
lat	side	collateral	tract	drag/pull	protractor
lin	line	collinear	verse/vert	turn	vertex
medi	middle	median			
meter/metry	measure	symmetrical			
mut	change	commutative			

Number Prefixes				
#	Latin	sample word	Greek	sample word
1	uni-	unicorn	mono	monopoly
2	bi	bicycle	di	digraph
	du(o)	dual		
3	tri	tricycle	ter	tertiary
4	quadr/quar	quarter	tetra	tetragon
5	quint	quintuplets	pent	pentagon
6	sex	sextuplets	hex	hexagon
7	sept	septuplets	hept	heptagon
8	octa/octo*		octa/octo*	octagon
9	nona/nove	November		
10	dec/deca/deci*		dec/deca/deci*	decade
100	cent	cent	hect	hectogram
1000	mille	millipede	kilo	kilometer

* same for Latin and Greek

Social Sciences Morphemes (Ron Yoshimoto compilation)

morpheme	meaning	sample word	morpheme	meaning	sample word
ab	away, from	abdicate	medi	middle	medieval
acro	high	acropolis	mega/ megalo	large	megalopolis
alt	high	altitude	meso	middle	mesozoic
anni/annu	year	annuity	migr	wander	migration
ante	before	antebellum	mony	condition	ceremony
anthropo	man	anthropology	nat	born	native
archaeo	ancient	archaeology	neo	new	Neolithic
arch(y)	ruler/gov't	monarchy	nesin	island	Melanesia
auto	self	autonomy	oid	resembling	anthropoid
capit/capt	head/leader	capitalism	olig(o)	few	oligarchy
cata	down	catacombs	ology	study of	archaeology
ceed/cede/ cess	go	recession	pac	peace	pacifism
circum	around	circumnavigate	paleo	old	paleontology
cis(e)/cid(e)	cut/kill	genocide	pan	all	pantheism
civ	citizen	civilization	pater/patri	father	patriarchy
clud(e)/ clus(e)	shut	exclusion	pend/pens	hang	independence
dem	people	democracy	petr	rock	petroglyph
dic/dict	say	dictator	phil/philo	love	philosophy
ethno	race/culture	ethnocentrism	phobia	fear	acrophobia
fac	make	factory	pict	paint	pictograph
feder	trust/faith	federalism	plu/plur	more	pluralism
frat	brother	fraternal	polis	city	metropolis
gamy	marriage	polygamy	pop	people	populist
gen	origin	indigenous	port	bring/carry	export
grad/gress	step	Congress	pos(e)	place	depose
gram/graph	write	pictograph	pre	before	preliterate
hab/habit	live	habitat	prim	first	primogeniture
hum	earth	humanity	proto	first	protozoa
ideo	idea	ideograph	psych	mind/soul	psychological
inter	between/among	interdependent	se	apart/away	secession
intra	within	intragroup	sed	sit	sedentary
ism	doctrine	communism	simil/simul	resembling	assimilate
ist	one who	anarchist	socio	society	sociology
ize	make	decentralize	soph	wisdom	philosophy
jud/jur/jus	law	jurisdiction	stitu	pace	constitution
leg	law	legislature	sub	below	suburban
liber	free	liberty	techni	skill/art	technocracy
lith	rock	paleolithic	theo	god	theology
liter	letter	preliterate	topo	place	topography
mania	madness	kleptomania	trans	across	transcontinental
manu	hand	manufacture	trib	pay	tribute
matri	mother	matrilineal	urb	city	urban
			vinc/vict	conquer	victory

Some Sample Matrices

ab ad de re se		duct "to lead"	ile ion or	
super	con			
post re under	pro		ive	ly ness

con de re se		duce "to lead"	ate	ed ion
re un	e		er ible	
re	in intro pro		ive	ness

astro		phys "natural science"	ic	al ist s
meta			io	logy
ge	o		ique	

poly "many"	gam	ist	s	
	y			
	gon	al		
	graph	s		
	nom	ial	s	
	pept	ide	s	
	phag	ia		
	the	ism		
		ist	ic	
	ureth*	ane		
	ploid			
un	satur	ate	ed	

mis pre re	calc "stone"	ule	able us	
			ate	ed ion or s
			ing	ly

acr an ep hom pseud syn	onym "name"	ous
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Created with **Mini Matrix-Maker**, at www.neilramdsen.co.uk/spelling/matrix

Created with Mini Matrix-Maker, at www.neilramdsen.co.uk/spelling/matrix

Useful Resources

Advanced Word Structure & History of the English Language:

- Anderson, C. Wilson, T. Elli Cross, and Joan Stoner. *VAK Tasks, Intermediate Prefixes, Roots and Suffixes series, Essential Roots series, Essential Prefixes series. Workbook of Resource Words for Phonetic Reading.* wvced.com. (several series for middle and high school)
- Barr, Cooper, Follis, Lindsay, Parsons. *Prefixes, Roots, Suffixes.* (3 reference texts.) wvced.com.
- Beck, Isabel L., Margaret G. McKeown, Linda Kucan. *Bringing Words to Life, Second Edition: Robust Vocabulary Instruction.* 2013. wvced.com. (reference-best practices)
- Beck, Isabel L., Margaret G. McKeown, Linda Kucan. *Creating Robust Vocabulary: Frequently Asked Questions and Extended Examples.* 2008. guilford.com. (reference-best practices)
- Bowers, Peter. *Teaching How the Written Word Works.* wvced.com. (matrices)
- Carreker, Suzanne. *Word Detective: Discovering The History of The English Language.* neuhaus.org. (word origins for younger students)
- Donah, Sandra. *Improving Morphemic Awareness Using Latin Roots & Greek Combining Forms.* wvced.com. (morphological awareness-advanced)
- Donah, Sandra. *Improving Morphemic Awareness Using Base Words & Affixes.* wvced.com. (morphological awareness-basic)
- Gold, Diane Hickey, Elaine Russo, Linda Wallace, Judy Shapiro. *PS: Prefixes, Suffixes, Roots (A Resource of Lists, Phrases, Sentences, Poems, and Stories).* wvced.com. (sequenced lessons, including words, phrases, sentences, and passages-basic level)
- Gold, Diana Hickey, Elaine Russo, Linda Wallace, Judy Shapiro. *PPS: Advanced Prefixes, Suffixes, Roots, and Connectives (Resource of Lists, Phrases, Sentences, Stories & Activities).* wvced.com. (sequenced lessons, including words, phrases, sentences, and passages-advanced level)
- Kemmer, Suzanne. *Words In English (website).* ruf.rice.edu/~kemmer/Words04. (website on history of English)
- King, Diana Hanbury. *English Isn't Crazy! The Elements Of Our Language And How To Teach Them.* proedinc.com. (straightforward history of English)
- Kleiber, Margaret. *Specific Language Training: An Orton-Gillingham Curriculum for Adolescents.* wvced.com. (adolescent Orton-Gillingham curriculum)
- McKeown, Margaret G., Paul D. Deane, Judith A. Scott, Robert Krovetz, & René R. Lawless. *Vocabulary Assessment.* 2017. wvced.com. (reference and best practices)
- Morgan, Kenneth B. *Dynamic Roots - Language Training Program.* wvced.com. (sequenced lessons, including words and sentences, thorough teacher's manual, and practice pages for each root)
- Van Cleave, William. *Everything You Want To Know & Exactly Where To Find It: A Reference Guide for Teachers of Orton-Gillingham & Other Multisensory Approaches.* wvced.com. (reference guide with teaching concepts and word lists covering morphological concepts--in addition to basic O.G.)
- Van Cleave, William & Caroline Dover. *Phrases & Sentences for Reading & Spelling.* wvced.com. (words from *Everything* text organized by concept and used in phrases and sentences)

Vocabulary & Morphology Websites:

etymonline.com dictionary.com vocabulary.com visualthesaurus.com
matrix maker (Bowers & Ramsden): <http://www.neilrammsden.co.uk/spelling/matrix/index.html>

Some Good Morpheme Lists:

- <http://www.4gaslps.com/CommonRootWd4MSciSocSt.pdf> (simple lists for math, science, social studies)
- <http://www.biologycorner.com/worksheets/language.html> (science roots)
- <http://www.readwritethink.org/files/resources/printouts/content-area-roots.pdf> (roots cross referenced by content with words for each content)
- <http://ancienthistory.about.com/od/mathematics/a/061210EtymologyGeometryTerms.htm>
(math terms in depth)

Selected Research Supporting Morphological Intervention:

- Bowers, P. N., Kirby, J. R., & Deacon, S.H. 2010. "The effects of morphological instruction on literacy skills: A systematic review of the literature." *Review of Educational Research*, 80, 144–179.
- Goodwin, A. P., & Ahn, S. 2010. "A meta-analysis of morphological interventions: effects on literacy achievement of children with literacy difficulties." *Annals of Dyslexia*, 60, 183–208.
- Goodwin, A. P. & Ahn, S. 2013. "A Meta-Analysis of Morphological Interventions in English: Effects on Literacy Outcomes for School-Age Children." *Scientific Studies of Reading*, 1–29, 2013.

Tracking Word Origins

A two-color poster-size version of this chart is available from W.V.C. ED.
Please do NOT copy this chart except for personal reference.

Latin Words: 55%

General Trends

usually multisyllabic words

few vowel teams besides ai: assail, retain

Common Structures

connectives i, u, and ul: mediate, monument, muscular, solitude

ti, si, and ci = /sh/: notation, crucial

tu = /choo/: eventual, fortunate, spatula

ture = /cher/: adventure, signature, nature

chameleon prefixes:
attention, collapse, difference, illegal

ct, pt: act, tempt

soft c before e or i:
certain, city

Anglo-Saxon Words: 20%

General Trends

usually one syllable words

numbers 1-1000: one, twenty

basic color words: brown, green

simple body parts: arm, throat

most sight words: could, do

most vowel teams: boat, house

short words with silent letters: ghost, know

Common Structures

ff-ll-ss words: cliff, tall, grass

ch = /ch/: chore, chin, bench

ck, tch, and dge: back, witch, edge

th in short words: than, thin, thick

k in short words: keep, kill, kind

wh: when, whisper

ng: hang, song, sting

wr: wrist, write

wild/old words: child, mind, post, told

2 syllable consonant-
le words: table, fizzle, hurdle

Greek Words: 11%

General Trends

often involve science, school, or the arts

Common Structures

connective o: democrat, photograph

γ = i: cyclone, gym, myth, type

ph = /f/: phobia, phonics, typhoon

ch = /k/: monarch, orchid, school

k in longer words: kilometer, kinesthetic

th in longer words: athlete, thyroid

silent initial p: pneumonia, psychology

ending -ology:
archaeology, biology

ending -ic: charismatic,
chronic, music