

BASE PAIRS

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Most people are familiar with the decimal system, in which ten different symbols (0 through 9) are used to represent numbers of any size. Our numbers are written in base 10, as distinct from base 2 which uses only the symbols 0 and 1. In base 2, the base 10 numbers 1 through 7 are rewritten as 1, 10, 11, 100, 101, 110, and 111. In base 16 (the hexadecimal system), used by computer programmers, the six letters A through F are added to the ten digits, resulting in "numbers" like AB9F which is equivalent to 43935 in base 10.

I consider a whole family of different bases, from base 11 (in which A is added) to base 36 (which contains the ten digits followed by A through Z). Some (but not all) of the "numbers" in these different bases will consist solely of letters, and even spell words. My object is to identify words in different bases which reduce to the same number in base 10. For example, one can show that GIRL in base 30 and BEER in base 34 both reduce to 449031 in base 10; these I call base pairs. Below I give a sampling of common base pairs of four or more letters. My investigation turned up relatively few pairs of five or more letters, and only one of six or more: GLOUTS and CASHES. There is one base triple: Lido 26 hale 28 akee 33.

The editor points out that base 26 words using letters only have been studied by Philip Cohen in the Feb 1977 Word Ways, and base 27 words (letters plus space) by Lee Sallows in May 1993.

dice 24	alga 26	fife 24	cage 26	fold 25	bald 28	folk 25	balk 28	leaf 23	brie 28
chap 28	back 29	mice 23	bare 29	gene 26	brag 29	keen 25	bran 30	Leon 25	fade 28
fare 28	bale 31	farm 28	bait 31	dope 29	Bali 31	lode 25	Clio 30	fibs 29	cook 31
lick 26	file 29	life 26	fins 29	harm 28	fish 29	flog 29	crop 31	loop 26	both 32
ells 30	dale 31	gala 29	Enid 30	gogo 29	bead 33	chap 32	beck 33	gold 29	beef 33
dome 31	bees 33	dose 31	chit 32	core 32	blew 33	Leon 27	flak 30	limn 27	hens 29
etch 31	disk 32	pace 26	mice 27	palm 26	mild 27	girl 30	beer 34	plod 26	drip 32
plop 26	golf 30	fake 31	bled 34	blob 34	anew 35	duns 32	blow 34	felt 31	cram 33
cues 33	brow 34	Finn 31	cuts 33	flee 31	buds 34	hood 30	abed 36	hoot 30	abet 36
jock 29	call 34	bite 35	Alps 36	mice 28	glib 31	gods 31	comb 34	kelp 29	cone 34
dual 33	cons 34	fact 32	bows 35	Mona 28	fake 32	fete 32	cuds 34	curl 34	aver 36
inks 32	cute 34	hail 31	fogs 32	leap 29	high 31	cabs 35	barf 36	deer 34	cape 35
lick 29	deft 34	Lido 29	card 35	limn 29	cays 35	Celt 35	beta 36	John 30	gait 32
joke 30	gale 32	hump 31	chit 35	kits 30	ills 31	Jane 31	hire 32	jeer 31	diet 35
pail 29	knob 31	pone 29	dike 36	pops 29	dime 36	pork 29	dins 36	jell 32	hogs 33
Nile 30	honk 33	nine 30	hope 33	nook 30	lids 31	gnaw 35	fact 35	ceded 15	oats 30
flew 35	echo 36	miss 31	foul 35	roll 29	more 31	hard 34	fume 35	pant 30	hear 34
muss 31	hems 34	silo 29	gabs 35	jets 33	game 35	snip 29	jibe 33	nigh 31	legs 32
lets 32	hugs 34	soon 29	hurt 34	mall 32	fool 36	malt 32	foot 36	maul 32	fowl 36
mice 32	fury 36	moss 32	heal 35	peel 31	hobo 35	laps 33	hump 35	puff 31	glad 36
puke 31	glen 36	noel 32	gout 36	trap 30	kiln 34	roll 31	jays 35	salt 31	jobs 35
sari 31	jogs 35	sash 31	John 35	sass 31	pore 32	nigh 33	lieu 34	shag 31	purr 32
noun 33	logs 34	taps 31	oath 33	tied 31	menu 34	Rome 32	palm 33	room 32	pans 33
rots 32	past 33	roue 32	pate 33	rump 32	nail 34	pill 33	jowl 36	tare 32	mesa 35
ruse 33	limb 36	rush 33	lime 36	sags 33	pubs 34	rows 34	pets 35	added 18	spit 34
ride 35	pals 36	toad 35	racy 36	hosts 30	argue 34	spore 31	place 35	mambo 31	cabin 36