

A CHALLENGE ANSWERED

DARRYL FRANCIS

Sutton, Surrey, England

Dave Morice's November 1994 Kickshaws referred to a challenge suggested by the late Tom Pulliam. Based on the sum of all its letter-values (assigning A=1, B=2, and so on), each word has a certain value (DEBUT=52, DUCHY=61). Tom Pulliam had enquired of Dave Morice how long a list of consecutive numbers may be formed in this way. Dave pointed out that such a list would have to start with the word A(=1) and be followed by AA(=2), BA(=3) and ABA(=4).

Although Tom Pulliam appeared to eschew the use of computers in tackling word puzzles such as this, they can be very effective in exploring such problems, allowing a variety of related puzzles to be posed and investigated. All the number-crunching work done for this article was tackled with the Lotus 123 spreadsheet; no programming languages or other "advanced" forms of computing were used.

Although my first thoughts were to see how far I could extend Dave's list of four words, I very quickly realised that the really interesting point was to determine the lowest number for which a word could not be found. The following list gives examples of word-weights all the way from 1 to 250. The first gap appears at 249. What words exist that generate a word-weight of 249? What's the next gap after 249?

To make the list of particular interest to **Word Ways** readers, I have tried to use many words with some sort of connection with words and language. Also, I have avoided plurals, proper names and hyphenated words. Of course, it may be necessary to use one or more of these categories to fill the 249 slot.

01 a	15 if	29 jar	43 zap	57 lingo
02 aa	16 pa	30 bible	44 talk	58 reading
03 ba	17 cam	31 coded	45 comma	59 pidgin
04 baa	18 adage	32 arm	46 accent	60 word
05 ad	19 do	33 or	47 verb	61 argot
06 cab	20 able	34 zag	48 digamma	62 dictate
07 be	21 of	35 to	49 enigma	63 meaning
08 cad	22 car	36 jay	50 idiom	64 noun
09 dad	23 in	37 blend	51 pun	65 rebus
10 babe	24 ear	38 cant	52 adverb	66 remark
11 fad	25 far	39 tar	53 slang	67 phrase
12 bead	26 rag	40 charade	54 coinage	68 language
13 had	27 by	41 clay	55 anagram	69 epigram
14 am	28 we	42 aleph	56 term	70 pangram

71	grammar	123	heteronym	175	wonderfulness
72	ideogram	124	rodomontade	176	antepenultimate
73	wordage	125	synonym	177	antitrinitarian
74	adverbial	126	wordiness	178	unphilosophical
75	write	127	accompaniment	179	ballistocardiogram
76	diacritic	128	decelerometer	180	lycanthropist
77	alphabetic	129	wordsmith	181	ventroloquial
78	prefix	130	anagrammatism	182	interchangeability
79	adjective	131	logologist	183	transformation
80	letter	132	pseudonym	184	unmarriageableness
81	square	133	malapropism	185	astronavigation
82	lexicon	134	crossword	186	vapourishness
83	elision	135	transposal	187	characteristically
84	bombastic	136	alliteration	188	typographically
85	wordy	137	anagrammatist	189	transposition
86	mnemonic	138	conjunction	190	prohibitiveness
87	sonnet	139	onomatopoeia	191	agriculturalist
88	alphabetic	140	haemodialysis	192	semitransparent
89	zanjero	141	lexicographer	193	juxtaposition
90	wording	142	interjection	194	subcommissioner
91	surname	143	spoonerism	195	autobiographically
92	etymon	144	portmanteau	196	hemidemisemiquaver
93	editorial	145	contresign	197	viniculturist
94	cryptic	146	decipherability	198	transcendentalist
95	capitalise	147	verbalisation	199	truthlessness
96	proverb	148	superlative	200	crystallography
97	cacographical	149	cryptonym	201	ventriloquist
98	grammatical	150	communication	202	transpositional
99	triolet	151	typographical	203	viticulturist
100	reversal	152	acknowledgement	204	unconscionableness
101	singular	153	terminology	205	tetrakishehexahedron
102	antonym	154	punctuation	206	tyrannosaurus
103	homonym	155	advertisement	207	semidemisemiquaver
104	syllabise	156	cryptological	208	ventriloquous
105	malediction	157	lymphatically	209	propriatorially
106	rumour	158	tautommetrical	210	progressiveness
107	palindrome	159	unperceivedly	211	transmogrification
108	logology	160	etymologist	212	metalinguistically
109	rhetorical	161	administrator	213	reproductiveness
110	bacchanalianism	162	adventuresome	214	threepennyworth
111	rhopalism	163	interrogative	215	subterraneously
112	calligraphy	164	knuckleduster	216	intercommunication
113	pronoun	165	interrogation	217	untranslatableness
114	wordplay	166	criminalisation	218	antitrinitarianism
115	consonant	167	superexcellence	219	proportionately
116	wordbound	168	yesterevening	220	irreprehensibleness
117	exclamation	169	quinquagenarian	221	subjectivistically
118	dictionary	170	vulnerability	222	uninterruptedly
119	syllabist	171	visualisation	223	proportionality
120	vocabulary	172	wholesomeness	224	incomprehensibleness
121	pejorative	173	pronouncement	225	exhibitionistically
122	anagrammatise	174	acrimoniously	226	theophilanthropism

227 tetrahydrocannabinol	239 gastroenterologist
228 trustworthily	240 uncommunicativeness
229 electrophysiological	241 insurmountableness
230 superfluousness	242 reconstructionist
231 psychotherapeutics	243 uncompromisingness
232 antivivisectionism	244 superconductivity
233 substitutionary	245 unprogressiveness
234 representativeness	246 constitutionality
235 cryptocrystalline	247 surreptitiously
236 superintendentship	248 superstitiously
237 transubstantiation	249
238 compartmentalisation	250 microminiaturisation

Perhaps readers might like to pick up where I have left off. How far beyond 250 can words be found? For good measure, I note that the familiar HUMUHUMUNUKUNUKUAPUAA weighs in at exactly 300, and the logologist's 45-letter old friend PNEUMONO... weighs in at an incredible 560.

To explore further the concept of word weights, I set to work on the names of the 105 chemical elements. All chemical elements have an atomic number (an integral number running from 1 to 105) and an atomic weight (a non-integral number running from 1 to 240+). Are any of the word-weights of the 105 elements equal to the corresponding atomic numbers, or (almost) equal to the corresponding atomic weights? As far as atomic numbers were concerned, two equivalences were noted: ERBIUM 68 and HAFNIUM 72. With regard to atomic weights, the nearest equivalence was IRON, which has an atomic weight of 55.857 and a word-weight of 56.

Checking the list of word-weights for the elements, it was interesting to note that there were many pairs of elements sharing the same word-weight (RADON and ZINC both 52), several groups of three elements with the same word-weight (BARIUM, BORON and CADMIUM all 64), one group of four elements sharing a word-weight (ALUMINUM, LANTHANUM, THORIUM and THULIUM all 104), and one group of five elements with the same word-weight (CURIUM, FERMIUM, FRANCIUM, SILVER and VANADIUM all 85).

If the word-weights are generated for all 50 US state names, what relationships can be spotted? Heading the list as the state with the lowest word-weight is ALABAMA, the name which appears at the head of an alphabetic list. Ten pairs of state names that have equal word-weights were spotted: NEVADA, OHIO 47; FLORIDA, KANSAS 65; DELAWARE, TEXAS 69; ARIZONA, ARKANSAS 84; CALIFORNIA, MARYLAND 88; TENNESSEE, WYOMING 106; KENTUCKY, MINNESOTA 110; NEW MEXICO, NEW YORK 111; CONNECTICUT, NORTH DAKOTA 127; SOUTH CAROLINA, WEST VIRGINIA 156.

Do any state capitals have the same word-weights as their corresponding state names? What is the largest city in each state which has the same word-weight as the corresponding state name?