

THE DISPATCHFUL BYEWORKMAN

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In this article we introduce the Dispatchful Byeworkman, a fellow closely related to the Gunpowdery Blacksmith (who is, as readers of *Word Ways* are well aware, the longest Unabridged Merriam-Webster two-word isogram). By contrast, the Dispatchful Byeworkman is an example of the longest two-word isogram crossword, with 21 letters in the two words but only 20 distinct letters (diagram at left below).

	D		J
	I	W A L T Z I N G	H U M P B A C K
	S	C	R
	P	H	G
B Y E W O R K M A N	Y		O
	T	D	N
	C	J U K E B O X	S W I F T L Y
	H	R	Z
	F	M	E
	U		D
	L		

Although they share an A, when linked these two words form an isogram. While N-word unlinked isograms and linked pangram crosswords have been extensively studied, it appears that the isogram crossword is relatively unexplored territory.

In general, we wish to find the maximum number of letters that can be put into an N-word crossword, given the requirement that it also be an isogram. Since a 5-word pangram crossword exists (see Feb 1977 *Word Ways*, or p 57 of *Making the Alphabet Dance*), only N=2,3,4 need to be investigated.

TWO-WORD ISOGRAM CROSSWORDS

We used a computer to search for two-word crosswords of maximum size and with every possible combination of word lengths. The maximum number of letters we were able to use was 20. The table below is a type-collection of all 20-letter combinations that we found. For each type we give the best example (most common words) and the number found.

14,7	BENZHYDROXAMIC WISTFUL (10 examples)
13,8	UNSYMPATHIZED BACKFLOW (1 example)
12,9	UNSYMBOLIZED PATCHWORK (7 examples)
11,10	DISPATCHFUL BYEWORKMAN (6 examples)

BENZHYDROXAMIC appears in all ten of the (14,7) isograms. Some other words that can link with it are JESTFUL, UPLIFTS, and LUTFISK.

THREE-WORD ISOGRAM CROSSWORDS

The maximum number of letters we were able to fit into a three-word crossword is 23. Here is a type-collection:

12,9,4	UNSYMBOLIZED WHIPGRAFT JOCK (3 examples)
12,8,5	UNSYMBOLIZED WHIPJACK GRAFT (3 examples)
12,7,6	FLOWCHARTING JUKEBOX DIMPSY (9 examples)
11,10,4	BUCKWASHING PLATFORMED JYNX (3 examples)
11,9,5	DOWNRIGHTLY HUMPBACKS VEJOZ (6 examples)
11,8,6	SQUAWKINGLY MATCHBOX PRIZED (11 examples)
11,7,7	LUMBERJACKS WAFTING XYPHOID (5 examples)
10,10,5	FORGIVABLY UNTHWACKED JUMPS (5 examples)
10,9,6	THUMPINGLY, ZWIEBACKS FJORDS (25 examples)
10,8,7	PACHYDERMS WALTZING JUKEBOX (31 examples)

The word VEJOZ (an Argentinian language) is quite useful in isogram crossword construction because among its five letters are three troublesome ones. The two most pleasing three-word crosswords, both of type (10,8,7), are diagrammed above.

FOUR-WORD ISOGRAM CROSSWORDS

The key question here is whether 25 distinct letters is the best that can be achieved, or if 26 (a pangram) is possible. We were unable to disprove Ross Eckler's conjecture (*Making the Alphabet Dance*) that a four-word pangram crossword appears impossible.

In addition to using our standard word list (basically the Second Unabridged Merriam-Webster), we augmented it with some prime pangram candidates such as CINQ, WAQF and QVINT. But even with these additions no four-word pangram crossword was discovered. However, over a thousand 25-letter examples were found.

Many of the 25-letter crosswords we discovered can be extended to a five-word pangram crossword containing a two-letter word (which seems to be a new configuration), by just sticking the single unused letter next to a vowel. For example (diagram at left below):

		B		S	P								
	V	E	J	O	Z								
		D	X										
C		R		V	E	J	O	Z					
H				W	R								
S	Q	U	A	W	K	I	N	G	L	Y			
	M		F			F	U	G	A	C	I	T	Y
	P		T			L	N						
						D	X						

Here is a type-collection of the different four-letter crosswords we were able to construct:

14,7,4,3	BENZHYDROXAMIC JESTFUL GAWK VIP (4 examples)
13,7,5,3	UNSYMPATHIZED JACKBOX FROWL VUG (1 example)
13,7,4,4	UNSYMPATHIZED JACKBOX GOWF VIRL (1 example)
12,9,4,3	UNSYMBOLIZED WHIPGRAFT JACK VEX (2 examples)
12,8,5,3	UNSYMBOLIZED WHIPJACK GRAFT VEX (1 example)
12,8,4,4	UNSYMBOLIZED WHIPJACK FROG VEXT (6 examples)
12,7,6,3	BACKSWORDING MYTHIZE VEXFUL JAP (2 examples)
12,7,5,4	CANDLEWRIGHT JUKEBOX VAMPS FOZY (13 examples)
12,6,5,5	BACKSWORDING THUMPS VEJOZ FLAXY (7 examples)
11,10,4,3	WORLDMAKING SUBJECTIFY QOPH VEX (3 examples)
11,9,5,3	DOWNRIGHTLY HUMPBACKS VEJOZ FIX (2 examples)
11,8,6,3	SQUAWKINGLY MATCHBOX PROVED FEZ (7 examples)
11,8,5,4	OVERFLIGHTS BACKDOWN AMPYX QUIZ (15 examples)
11,7,6,4	NOVELWRIGHT JACKBOX DIMPSY FUZE (26 examples)
11,7,5,5	XYLOGRAPHIC MUDBANK SWIFT VEJOZ (39 examples)
11,6,6,5	ZENITHWARDS PEGBOX VIMFUL JACKY (17 examples)
10,10,4,4	ADJUNCTIVE XYLOGRAPHS FOWK ZIMB (1 example)
10,9,6,3	THUMPINGLY ZWIEBACKS FJORDS VEX (9 examples)
10,9,5,4	BEWITCHFUL ZYGOSPERM VODKA JINX (53 examples)
10,8,6,4	ZINCOGRAPH SQUAWKED JUMBLY VEXT (46 examples)
10,8,5,5	HUMPBACKED WAXINGLY VEJOZ FORTS (37 examples)
10,7,7,4	FETCHINGLY JUKEBOX WIZARDS VAMP (45 examples)
10,7,6,5	BUCKINGHAM POSTFIX DRAWLY VEJOZ (59 examples)
10,6,6,6	HUMPBACKED JUSTLY FROWZY VEXING (6 examples)
9,9,6,4	JOCKSTRAP EMBODYING VEXFUL WHIZ (75 examples)
9,8,8,3	SQUAWKING MATCHBOX PROVEDLY FEZ (10 examples)
9,8,7,4	EXPLODING JACKFISH QUARTZY WOMB (103 examples)
9,8,6,5	SKETCHPAD VEXINGLY FROWZY JUMBO (153 examples)
9,7,7,5	ZYGOSPERM JACKBOX UNVALID WHIFT (102 examples)
9,7,6,6	PATCHWORK BENZOXY JUDGES VIMFUL (95 examples)
8,8,8,4	FUMBLING WHIPJACK VEXATORY ZEDS (14 examples)
8,8,7,5	FERVIDLY SWAMPING JACKBOX QUOTH (155 examples)
8,8,6,6	ZWIEBACK PHORMINX VATFUL SQUDGY (56 examples)
8,7,7,6	WALTZING VERSIFY JACKBOX HUMPED (215 examples)
7,7,7,7	BOXFISH JUMPING QUARTZY WEDLOCK (30 examples)

All the crosswords in the above table have three points of intersection, but with four words it is possible to have four. This requires an additional letter (a total of 29 letters) if we still want to have 25 distinct ones. This makes it a much harder problem; in fact we were only able to find one such crossword of acceptable quality (diagrammed one page earlier). Besides the aforementioned VEJOZ, it uses three OED headwords.