# 6x6 MAGIC WORD SQUARES

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This article shows how to construct a 6x6 magic word square using the method described in my "Eulerian Magic Word Squares" (November, 1996). The method is based on starting with an Eulerian square, but since a 6x6 Eulerian square does not exist, I must modify the method to make it work. Figure 2 is a well-known magic square. Figure 3 is derived from it by converting to base 6. Let's convert it to words, first for ordinary gematria, then for wints.

| | | | | | |
|---|---|---|---|---|---|
| 1 | 35 | 34 | 3 | 32 | 6 |
| 30 | 8 | 28 | 27 | 11 | 7 |
| 24 | 23 | 15 | 16 | 14 | 19 |
| 13 | 17 | 21 | 22 | 20 | 18 |
| 12 | 26 | 9 | 10 | 29 | 25 |
| 31 | 2 | 4 | 33 | 5 | 36 |

fig2

| | | | | | |
|---|---|---|---|---|---|
| 00 | 54 | 53 | 02 | 51 | 05 |
| 45 | 11 | 43 | 42 | 14 | 10 |
| 35 | 34 | 22 | 23 | 21 | 30 |
| 20 | 24 | 32 | 33 | 31 | 25 |
| 15 | 41 | 12 | 13 | 44 | 40 |
| 50 | 01 | 03 | 52 | 04 | 55 |

fig3

In Figure 3, either the left or right digits of some rows and columns contain the numbers 0,1,2,3,4,5 as would be true of <u>all</u> rows and columns in an Eulerian square. Here, other rows and columns contain 0,0,0,5,5,5 or 1,1,1,4,4,4 or 2,2,2,3,3,3. To utilize this scheme, note that the place value of T = 20 can be matched by D+P = 4+16, or B+R = 2+18, or G+M = 7+13, or H+L = 8+12. (F+N = 6+14 is not useful because too few words begin with N.)

Figure 1 (see next page) describes useful words. Each "x" marks an existing combination of a beginning letter and an ending frag. Most combinations are common words, but the few marked with a capital X must be found in Webster's Second or Third. By trial, we can find pairs of end frags with common gematric sums. Match these with appropriate beginning letters to build the magic word squares of Figure 4 and Figure 5 (next page). The first square uses three pairs of beginning letters; the second uses two pairs and a T matched with a blank. Figure 6 gives the gematric values corresponding to Figure 5 (the magic constant is 219). Each of these two magic word squares contains four or five uncommon words. I was unable to build the squares without them, but I see no reason why better-quality squares cannot be found.

Figure 7 is designed to build 6x6 wint squares. I see no hope of using anything longer than three-letter words. Words marked with lower-case x can be found in OSPD or Chambers Twentieth Century or

the 10th Collegiate. Words marked with a capital X come from Webster's Third. Words with a capital Y or Z come from Webster's Second; the latter are reformed spellings.

Figure 8 is a magic wint square. Figure 9 gives the corresponding wint values. The magic constant is 43983 = BFI@. Note that the middle letter in all the words is A. The final letters are based on the relationship D+W = G+T = M+N = 27. (H+S is also equal to 27, but we do not have enough words ending in H.) Figure 7 indicates many other combinations like AG+OM = AM+OG = AP+OD, but either the matrix is not quite full for these end frags, or one of the frags is not a word that allows T and no other letter at the beginning. Although I had not planned it, the beginning of each word produced gematric values (Figure 9) that follow the underlying numerical values closer than any other square I have found.

| fig1. | d | p | b | r | g | m | h | l | t |
|---|---|---|---|---|---|---|---|---|---|
| 14 am | x | x | x | x | x | | x | x | x |
| 18 ale | x | x | x | x | x | x | x | | x |
| 21 at | | x | x | x | x | x | x | x | x |
| 23 end | | x | x | x | | x | x | x | x |
| 23 in | x | x | x | | x | X | x | X | x |
| 24 are | x | x | x | x | X | x | x | x | x |
| 24 ear | x | x | x | x | x | X | x | x | x |
| 25 all | | x | x | | x | x | x | x | x |
| 26 ate | x | x | x | x | x | x | x | x | X |
| 27 ags | x | | x | x | x | x | x | x | x |
| 28 ash | x | x | x | x | x | x | x | x | X |
| 29 it | x | x | x | X | x | X | x | x | x |
| 32 ole | x | x | x | x | X | x | x | | x |
| 33 ill | x | x | x | x | x | x | x | X | x |
| 34 ams | x | x | x | x | x | | x | x | x |
| 37 ales | x | x | x | x | x | x | x | | x |
| 42 ins | x | x | x | | x | X | x | X | x |
| 43 ears | x | x | x | x | x | X | x | x | x |
| 45 ays | x | x | x | x | x | x | x | x | X |
| 48 its | x | x | x | X | x | X | x | x | x |
| 52 ills | x | x | x | x | x | x | x | X | x |

| | | | | | |
|---|---|---|---|---|---|
| BOLE | ROLES | REARS | BAILS | RILL | BILLS |
| PILLS | DILL | PEARS | PAILS | DOLES | DOLE |
| MILLS | MOLES | GAILS | GEARS | GILL | MOLE |
| GOLE | GOLES | MAILS | MEARS | MILL | GILLS |
| DILLS | PILL | DAILS | DEARS | POLES | POLE |
| ROLE | BILL | BEARS | RAILS | BOLES | RILLS |

fig4

| | | | | | |
|---|---|---|---|---|---|
| AG | TASH | TIT | EAR | TALL | AYS |
| MAYS | GALL | MIT | MEAR | GASH | GAG |
| LAYS | LASH | HEAR | HIT | HALL | LAG |
| HAG | HASH | LEAR | LIT | LALL | HAYS |
| GAYS | MALL | GEAR | GIT | MASH | MAG |
| TAG | ALL | IT | TEAR | ASH | TAYS |

fig5

| | | | | | |
|---|---|---|---|---|---|
| 8 | 48 | 49 | 24 | 45 | 45 |
| 58 | 32 | 42 | 37 | 35 | 15 |
| 57 | 40 | 32 | 37 | 33 | 20 |
| 16 | 36 | 36 | 41 | 37 | 53 |
| 52 | 38 | 31 | 36 | 41 | 21 |
| 28 | 25 | 29 | 44 | 28 | 65 |

fig6

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 31 | ad | x | x | x | x | x | x | x | x | x |
| 34 | ag | x | | x | x | x | x | x | x | x |
| 40 | am | x | x | x | x | x | X | x | x | x |
| 41 | an | Y | x | x | x | x | x | X | Y | x |
| 43 | ap | x | x | X | x | x | x | x | x | x |
| 45 | ar | X | x | x | | x | x | X | x | x |
| 47 | at | | x | x | x | x | x | x | x | x |
| 50 | aw | x | x | Y | x | X | x | x | x | x |
| 155 | et | Z | x | x | x | x | x | x | x | x |
| 247 | id | x | | x | x | x | x | x | x | x |
| 250 | ig | x | x | x | x | x | x | | | |
| 259 | ip | x | x | | x | x | | x | x | x |
| 263 | it | x | x | x | | x | X | x | x | x |
| 409 | od | X | x | x | x | x | x | x | | x |
| 412 | og | x | | x | Y | x | x | x | x | x |
| 418 | om | x | x | Z | Y | X | x | | | x |
| 421 | op | x | x | x | | | x | x | x | x |
| 425 | ot | x | x | x | x | x | x | x | x | x |
| 428 | ow | x | x | x | x | | x | x | x | x |
| | | d | p | b | r | g | m | h | l | t |

fig7.

| | | | | | |
|---|---|---|---|---|---|
| BAD | RAT | RAN | BAM | RAG | BAW |
| MAW | GAG | MAN | MAM | GAT | GAD |
| LAW | LAT | HAM | HAN | HAG | LAD |
| HAD | HAT | LAM | LAN | LAG | HAW |
| GAW | MAG | GAM | GAN | MAT | MAD |
| RAD | BAG | BAN | RAM | BAT | RAW |

fig8.

| | | | | | |
|---|---|---|---|---|---|
| 1489 | 13169 | 13163 | 1498 | 13156 | 1508 |
| 9527 | 5137 | 9518 | 9517 | 5150 | 5134 |
| 8798 | 8795 | 5872 | 5873 | 5866 | 8779 |
| 5863 | 5879 | 8788 | 8789 | 8782 | 5882 |
| 5153 | 9511 | 5143 | 5144 | 9524 | 9508 |
| 13153 | 1492 | 1499 | 13162 | 1505 | 13172 |

fig9.