A *shift* is the process which occurs when the letters of one word are all shifted the same number of steps along the alphabet (looping from Z to A) to make another word. For example OHM +1 = PIN, whilst CHEER + 7 = JOLLY. Here, I refer to these as *basic shifts*. This article examines other types of shift in which the shift values are not all the same but which abide by various rules. Each series of shift values makes a *shift pattern*.


Locations, identified by country, are taken from the United States Board on Geographic Names.

**PROGRESSIVE SHIFTS - 4 LETTERS**

A *progressive shift* is the name I give to shifts in which the shift values increase from one letter to the next such that the difference between the succeeding shift values is constant. This difference can be called the *progressive constant* (*PrC*). In order to avoid a letter shifting to itself (A to A, B to B etc.), which could be considered as a shift value of 0 or 26, shift values are here restricted to 25. This avoids looping more than once round the alphabet. This restriction, however, results in a decrease in the number of possible shift patterns as the *PrC* increases. Thus, in the case of 4-letter words, there are 22 shift patterns for a *PrC* of 1 (1.2.3.4 to 22.23.24.25) but only 1 pattern for a *PrC* of 8 (1.9.17.25.). Below, a single example is given for each of the shift patterns which abide by *PrC*'s of 1 to 8.

**PROGRESSIVE CONSTANT = 1**

<table>
<thead>
<tr>
<th>Shift Pattern</th>
<th>1.2.3.4.</th>
<th>4.5.6.7.</th>
<th>7.8.9.10.</th>
<th>10.11.12.13.</th>
<th>13.14.15.16.</th>
<th>16.17.18.19.</th>
<th>19.20.21.22.</th>
<th>22.23.24.25.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RIVA - SKYE</td>
<td>PRAY - RUED</td>
<td>KNEE - SWOP</td>
<td>LOAF - WANT</td>
<td>OWEN - CLUE</td>
<td>KISS - BALM</td>
<td>STEW - MOAT</td>
<td>SAGO - OXEN</td>
</tr>
<tr>
<td></td>
<td>2.3.4.5.</td>
<td>3.4.5.6.</td>
<td>6.7.8.9.</td>
<td>10.11.12.13.</td>
<td>14.15.16.17.</td>
<td>17.18.19.20.</td>
<td>20.21.22.23.</td>
<td>22.23.24.25.</td>
</tr>
<tr>
<td></td>
<td>ARID - BUNK</td>
<td>MILK - ROSS</td>
<td>BRAY - NEON</td>
<td>DEAN - SURF</td>
<td>MAIM - ETCH</td>
<td>MAIM - ETCH</td>
<td>MAIM - ETCH</td>
<td>MAIM - ETCH</td>
</tr>
<tr>
<td></td>
<td>3.5.7.9.</td>
<td>4.5.6.7.</td>
<td>6.7.8.9.</td>
<td>9.10.11.12.</td>
<td>12.13.14.15.</td>
<td>15.16.17.18.</td>
<td>18.19.20.21.</td>
<td>21.22.23.24.</td>
</tr>
</tbody>
</table>

**PROGRESSIVE CONSTANT = 2**

<table>
<thead>
<tr>
<th>Shift Pattern</th>
<th>1.3.5.7.</th>
<th>4.6.8.10.</th>
<th>7.9.11.13.</th>
<th>10.12.14.16.</th>
<th>13.15.17.19.</th>
<th>16.18.20.22.</th>
<th>19.21.23.25.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ARID - BUNK</td>
<td>CLAD - GRIN</td>
<td>HEAL - ONLY</td>
<td>TIED - DUST</td>
<td>PLUS - CALL</td>
<td>GIRO - WALK</td>
<td>HALT - AVIS</td>
</tr>
<tr>
<td></td>
<td>2.4.6.8.</td>
<td>5.7.9.11.</td>
<td>7.9.11.13.</td>
<td>11.13.15.17.</td>
<td>14.16.18.20.</td>
<td>17.19.21.23.</td>
<td>18.20.22.24.</td>
</tr>
<tr>
<td></td>
<td>BELL - DIRT</td>
<td>ABED - FINO</td>
<td>HERE - PODS</td>
<td>EVAN - PIPE</td>
<td>EMIT - SCAN</td>
<td>BUNS - SNIP</td>
<td>BORG - TINE</td>
</tr>
</tbody>
</table>
PROGRESSIVE CONSTANT = 3
1.4.7.10. OATH - PEAR 2.5.8.11. MILD - ONTO 3.6.9.12. DUDS - GAME
16.19.22.25. SKIT - IDES

PROGRESSIVE CONSTANT = 4
1.5.9.13. STIR - TYRE 2.6.10.14. PUDS - RANG 3.7.11.15. FLAP - ISLE
13.17.21.25. CUTE - PLOD

PROGRESSIVE CONSTANT = 5
1.6.11.16. SIAN - TOLD 2.7.12.17. MUSH - OBEY 3.8.13.18. PONG - SWAY
10.15.20.25. FLOE - PAID

PROGRESSIVE CONSTANT = 6
4.10.16.22. WISE - ASIA 5.11.17.23. WARS - BLIP 6.12.18.24. WONG - CAFE
7.13.19.25. CHAT - JUTS

PROGRESSIVE CONSTANT = 7
1.8.15.22. GAWP - HILL 2.9.16.23. FLOG - HUED 3.10.17.24. PARR - SKIP
4.11.18.25. ALMS - EWER

PROGRESSIVE CONSTANT = 8
1.9.17.25. BRAT - CARS

PROGRESSIVE SHIFTS - MORE THAN 4 LETTERS
These progressive shifts have 5 letters. In each case the PrC' is 1.
1.2.3.4.5. DREAM - ETHER (see below)
4.5.6.7.8 ABILA (Spain etc.) - EGOSI (Nigeria)
6.7.8.9.10. CHORD - IOWAN, MIAMI - SPIVS
12.13.14.15.16. UNDER - GARTH

Seemingly, the only reference concerning what I call progressive shifts to grace the pages of Word Ways appeared in WW79050 as a short potpourri item. Roger Hannah 'challenged readers to determine the rule used to construct the following word pair set': O-P, NU-OW , EMU-FOX, RIBS-SKEW, DREAM-ETHER, and the 6-letter SPRENG - TRUISM. In our terminology, the answer is that, in each case, the PrC' is 1 and the initial shift is a single letter shift.

PROGRESSIVE SHIFT CHAINS
Adjacent words in these progressive shift chains are linked by the same shift pattern. In each case the PrC' is 1:
9.10.11. RAX (a stretch) - AKI (a tree) - JUT - SEE - BOP - KYA (an African's hut) - TIL (a plant)
2.3.4.5. NOWT - PRAY - RUED
8.9.10.11. STUG (a pig trough) - ACER - ILOC (Philippines) - QUYN (queen)
It is possible to construct a chain in which the PrCs 1 to 11 are represented in order.

**PROGRESSIVE PROGRESSIVEhifts**

Progressive progressive shifts seems a suitable term to apply to those shift patterns which move forward a constant amount from one word to the next:

**REGRESSIVE SHIFTS**

Perhaps this is a suitable stage at which to point out that any progressive shift becomes a regressive shift (or vv) when the two words exchange places. For example, the progressive shift WON - LEE (15.16.17.) becomes the regressive shift LEE - WON (11.10.9.). The respectively-placed numbers in the two opposing shift patterns always add up to 26 (15+11, 16+10, 17+9). In this particular case, if the letters of these 2 words are reversed we also have EEL - NOW (9.10.11.) and NOW - EEL (17.16.15.).

The regressive shift VAL - QUE (21.20.19.) is unusual in that the two words combine to make another word - VALQUE (Nicaragua).

**PROGRESSIVE SHIFTS INVOLVING VARIOUS WORD GENRES**

All except one (*) of the progressive shift patterns below have a PrC of 1.

**PALINDROMES**

- 1.2.3. ZYX - AAA, DUB - EWE 5.6.7. MOM - RUT 15.16.17. MOM - BED
- 3.4.5.6. HAZE - KEEK, BONY - ESSE 5.6.7.8. HUTE (hoot) - MAAM
- 9.10.11.12. DEED - MOPP (mop) 13.14.15.16. HEDE (have, head, heed) - USSU (issue)
- 15.16.17.18. WONT - LEEL (edd) 19.20.21.22. MOOM (New Guinea) - FIJI

The word KUTH (couth) can be progressively shifted to make the palindromes shown. Basic shifts connect the palindromes:

**TAUTOYNYMS**

A tautonym may form one word of a shift pair:

- 3.4.5.6. IEIE (a screw-pine) - LINK 18.19.20.21. EYEY (full of eyes or holes) - WRYT (write)

**MIAMI WORDS** (pattern 12?12)

Miami words can also be progressively shifted:

- 2.3.4.5.6. MIAMI - OLERO (Kenya) 9.10.11.12.13. SENSE - BOYER (Charles)
WORDS MADE FROM ALPHABETICALLY-CONSECUTIVE LETTERS

The top row below shows how certain 3-letter words, consisting of alphabetically-consecutive letters in order, can be linked by basic shifts. Their reversals, on the bottom row, are also linked by the same basic shifts. In between, the two sets of words behave as the target, and source, respectively, of progressive shifts using the palindromic word AAA (chief of the signet bearers in the court of the Egyptian king Aspalut). All the shifts linked to AAA have a PrC of 1.

PIVOTAL SHIFTS

Pivotal Shifts is the name I give to letter shifts which all start at the central letter (pivot) of a word with an odd number of letters and shift, in turn, to each of the other letters of the word from left to right. Consider MOGUL. The pivot is G and hence the pivotal shifts are G to M (6), G to O (8), G to U (14), and G to L (5). In this, and most words with an odd number of letters, the length of the shifts bear no relation to each other. Occasionally, however, we come across words in which the pivotal shifts form a pattern. The two words below demonstrate pivotal types of progressive and regressive shifts respectively.

In the first word, ILFOR, the pivotal letter F is shifted to the four letters I, L, O and R in turn. The length of each shift supersedes the length of the previous shift by the same number of steps: F to I (3), F to L (6), F to O (9), F to R (12). It could be said that the word ILFOR has a pivotal PrC of 3. ILFOR is the name of a stream in East Timor.

In KIDGE, the pivotal letter D is similarly shifted to K, I, G and E in turn. In this case, however, the length of each shift is shorter than the length of the previous shift by the same number of steps: D to K (7), D to I (5), D to G (3), D to E (1). Thus KIDGE has a pivotal regressive constant of 2. KIDGE = ‘kedge’ - meaning brisk, lively, in good spirits.

NUMBER SERIES AS SHIFT PATTERNS

A group of adjacent numbers extracted from a particular number series can be used as a shift pattern. With one exception (*) the shift values below progress but not by a constant amount. The reader is reminded that the maximum shift value under consideration is 25. The significance of + is explained in the later section entitled The Difference Between Successive Shift Values.
FIBONACCI Shifts

Fibonacci number series: 1.1.2.3.5.8.13.21...
1.*1.2.3. CHIP - DIKS, SHAH - TICK, STEP - TUGS
1.2.3.5. ICON - JERS, OMIT - POLY, TEEN - UGHS
2.3.5.8. BLOW - DOTE, NODE - PRIM, RODE - TRIM
3.5.8.13. LOAF - OTIS, POSE - STAR, PRAT - SWIG
5.8.13.21. DENS - IMAN (Imam), FAYS - KILN, OWES - TERN

SQUARE Shifts

Square numbers: 1.4.9.16.25...

4 letters
1.4.9.16. LARD - MEAT, MAIN - NERD, GAIN - HERD
4.9.16.25. AMOS - EVER, KILT - ORBS, WISE - ARID

5 letters
1.4.9.16.25. MAMOS (sunbirds) - NEVER

Prime Shifts

Prime numbers: 2.3.5.7.11.13.17.19.23...

4 letters
2.3.5.7. PRAY - RUFF, PRIM - RUNT
3.5.7.11. AVON - DAVY, IDLE - LISP, PONS - STUD, PORT - STYE
5.7.11.13.+ CRAN - HYLA (a toad), DOTE - IVER (ivory), JOTA - OVEN, VEAL - ALLY
7.11.13.17.+ LANG - SLAT, YARM - FLED, THUN - ASHE
11.13.17.19.+ ANIL - LAZE, HUNK - SHED, HURT - SHIM, TINY - EVER
13.17.19.23.+ ANEW - NEXT, GRUB - TINY, SNUG - FEND

5 letters
5.7.11.13.17. CHARM - HOLED

SPECIAL Shift PATTERNS

Again, in the lists below, the successive shift values do not have a PrC'. The shift patterns represent a selection of the many palindromic, tautonymic and Miami numerical patterns. The words themselves exclude any palindromes, tautonyms or Miami words.

PALINDROMIC Shift PATTERNS

4 letters
1.2.2.1. AMID - BOKE 1.3.3.1. SERF - THUG 1.4.4.1. SEAR - TIES
2.4.4.2. NEAP - PIER 8.23.23.8. DREW - LOBE 11.3.3.11. SLIT - DOLE
13.1.1.13. RUDE - EVER 14.4.4.14. BASE - PEWS 25.5.5.25. SPOT - RUTS

5 letters
1.2.3.2.1. RARER - SCUGS 1.6.9.6.1. BUILD - CARRÉ 14.9.3.9.14. FYFES - THING
16.3.22.3.16. DEMON - THIRD 23.7.14.7.23. WAUGH - THINE

6 letters

TAUTONYMIC Shift PATTERNS

4 letters
1.2.1.2. ICED - JEFF 1.4.1.4. LARD - MESH 1.12.1.12. BIRD - CUSP
3.23.3.23. PRIG - SOLD 4.11.4.11. SWAN - WHEY 9.3.9.3. TORY - CRAB

6 letters
MIAMI SHIFT PATTERNS
1.2.3.1.2. DEVOR - EGYPT 13.7.24.13.7. EXCEL - REARS 13.10.22.13.10. THIRD - GREEN
25.1.7.25.1. TONER - SPUDS 25.20.11.25.20. CAMPS - BUOXOM

OTHER SHIFT PATTERNS
Theoretically, any relatively short series of numbers can form a shift pattern. With 4 digits, ‘years’ offer themselves as shift patterns. Special years can be selected. In this particular case, both the words are apposite to the event:
1.4.9.2 SAIL - TERN (sea bird) In fourteen hundred and ninety two, Columbus sailed the ocean blue...

THE DIFFERENCE BETWEEN SUCCESSIVE SHIFT VALUES
In certain shifts the difference between successive shift values is significant. Consider the 3-word chain GRUB 13.17.19.23. TINY 11.13.17.19. EVER. The differences between the successive shift values are palindromic. GRUB 4.2.4. TINY 2.4.2. EVER. More palindromic examples (marked +) can be found earlier in the article under Number Series as Shift Patterns - Prime Shifts.
The differences between the successive shift values of some reversals are palindromic:
PINS 3.5.21.23. (2.16.2.) SNIP FLOG 1.3.23.25. (2.20.2.) GOLF SPAY 6.11.15.20. (5.4.5.) YAPS
The differences between the successive shift values may be tautonymic...
CHARM 5.7.11.13.17. (2.4.2.4.) HOLED
...or adhere to a Miami pattern:
COLAGE (college - web2) 1.6.7.19.24.25. (5.1.12.5.1.) DUSTED

MISCELLANEOUS
Here, the SAME BIGRAM appears in both words: 12.13.14.15. FREE - REST, HUGO - THUD

NAMES can be progressively shifted to make other names:
<table>
<thead>
<tr>
<th>PrC</th>
<th>IAN - LES, KAY - NED</th>
<th>IVY - MAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrC</td>
<td>REG - TIM 9.11.13</td>
<td>ADA - JON, IDA - RON</td>
</tr>
</tbody>
</table>

13.23.8.13.23. SUSAN - FRANK has a Miami shift pattern.

Some progressive, and other, shifts make PHRASES:
Progressive Shifts
<table>
<thead>
<tr>
<th>PrC</th>
<th>LORD - SWAN 14.15.16. OLD - CAT 15.16.17.18. NEAT - CURL</th>
</tr>
</thead>
<tbody>
<tr>
<td>PrC</td>
<td>PAY - ANN 11.13.15</td>
</tr>
<tr>
<td>PrC</td>
<td>TEAM - WORK 3.10.17.24.</td>
</tr>
</tbody>
</table>
Palindromic Shift
1.2.2.2.1. ROSY'S - SQUAT
Tautonymic Shifts
1.4.1.4. ANN'S - BROW
1.12.1.12. FOSS - GATE (FOSSGATE is the name of a street in the city of York, England)
Miami Shift
13.10.22.13.10. THIRD - GREEN

Finally, word has it that SHIFT itself has moved to TONGA - via Miami!