INTERNAL ISOMORPHS

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Internal Isomorphs are what I call words which can be cut into 2 or more sections, each with an equal number of letters, and with identical letter patterns with reference to the number and position of repeated letters. Vowels and consonants are not differentiated. Thus the surname of the British Prime Minister (1945-51), Clement ATT.LEE, is an internal isomorph. I have introduced a further constraint. Specifically, a particular letter cannot appear in more than one section of the word. Thus, in words cut into 2, any letter which appears in the first half of the word must not appear in the second half of the word. This sorts the wood from the trees dramatically!

In words cut into 2 sections, only the letter pattern of the first half of the word is given (see below). Thus - - 1 - 1 represents an internal isomorph with the letter pattern - - 1 - 1 - - 2 - 2. The number of possible letter patterns is given in brackets. Repeated letters are underlined.


2 LIKE LETTERS IN EACH HALF

4-LETTER WORDS (1 pattern only)
In a Kickshaws item called Double Double Trouble (WW2001141), I listed 4-letter words composed of 2 doubled letters. Here are 3 additions to that list:
1 1 AA.BB (Abb ej Jinnate - Syria). AA.RR (Aarr ej Jamouss - Lebanon). EE.SS (hod)

6-LETTER WORDS (3)
1 1 - - AAL.IIS (ospd). CCA.NNY (long). LLE.DDF (tmwd). SSO.LLE. SSO.PPE. SSU.LLE. VVE.LLA (nz)
1 - 1 CIC.ADA. GIG.QLO. IBI.SES. MEM.NON. POP.EYE etc. (see Sequential Words WW2005003)
- 1 1 ABB.OTT. ACC.ESS. INN.ESS. OSS.ETT (in Yorkshire, UK)

8-LETTER WORDS (6)
1 1 - - LLAN.DDEW (Wales, UK). OOLE.MMAS (sted). SSHU.LLEN. SSSI.PPER
1 - 1 - AWAK.ENED. COCK.EREL. ODOM.ETER. SYST.EMED. TETR.ODON. UVUL.ITIS
1 - - 1 BARB.QUE. CON_CEIVE. DRUD.ING. EXTE. RIOR. SUBS.ERVE
- 1 - 1 ANNI.SEED. BEED.HOOK. COOL.WEED. ODDD.ALLS. TEEN.HOOD. WEEV.ILLY
- 1 1 GADA.RENE. HOLO.CENE. JAPA.NESE. PHTH.YSIS. YOKO.HAMA
- - 1 BALL.OTEE (cham). BUTT.RESS. MATT.RESS. MISS.PELL (cham). TALL.NESS

10-LETTER WORDS (10)
1 - 1 - - AWAKE.NINGS. MEMOR.ISING. RURAL.ITIES
1 - - 1 CAMCO.RDERS. COLCH.ESTER (in Essex, UK). INFIL. TRATE. PROPH.ESIED
1 - - - 1 ENUME.RATOR. GRUDG.EABLE. HAUGH.TIEST
FOOTBALL, OFFSPINNER (in cricket), WOODCUTTER
MINISTERED, SOJOURNING, TOXOPHILIC, UNANSWERED
CONFUSION, PALEARMIC, SELF-DGAIN, TURBULENCE
CHEERFULLY, COMMANDEER, KITTEHNOD, PECCADILLO
CHORIDEAE, PHOTOCLYSIS (to decorate with guilloches), STEADYABILL (‘steadable’ = helpful)

12-LETTER WORDS (15)
AGAMOGENETIC, NONDYSPEPTIC (web2), NONUMBILICAL (web2)
CARCINOPHOBIC (from ‘carcinophobia’ - sted), EXCEPTORIOUS, SUBSCRIPTION
ALPHABETISED, POSTPRANDIAL, UNCAUTERIZED
CONJECTURIST, UNSENIOR, LOCH
DOORSTEPPING (cham)
CONGLOMERATE, COTYLOSAURIA, RACKHAMESQUE
CARRIONELLUS (I1Z), H-commercial, LACCOBIUS (11=)
CONJUREST, UNSEPULCHRAL

14-LETTER WORDS (21)
MEMBRANOLOGIST (from ‘membranology’)
EUDEMONISTICAL
ALTGANDERSHEIM (Germany)
CRATICHNEUMONS (Iz)
MONOPHYTICAL
URETHROVAGINAL (sted)
BOGDANOVSKIY (2 locations called Bogdanovskiye in Ukraine and Russia)
OVERDES CANTING (web2)
LANDOWNERSHIPS (coll)
TACORIOBUENDE (Angola)
SCHROTTENKLAMM (Austria), SCHWITTERKNAPP (Germany)

3 LIKE LETTERS IN EACH HALF
BOBBEE, TUTTEE (hod)
URUGUIANA (Brazil)
TRATTESEE (Austria)
PUUNUAARAA (Finland)
MATAANII (Somalia), XAWAAIJII (Somalia)
LIHIRIYAGAMA (Sri Lanka), KOPOYOMAHANA (Colombia)
OGORODNAJAMAKI (Russia)
KURUNDUGAHAELA (Sri Lanka)
SKAAPDMLEEGTE (S. Africa)
112

2 DIFFERENT LIKE LETTERS IN EACH HALF

8-LETTER WORDS (3)
1 2 2 1 ILLI ASSA (Gambia) (see Sequential Words)
1 2 1 2 TITI CACA (Peru) etc. (see Sequential Words)

10-LETTER WORDS (15)
1 2 2 1 - APPAT ILLIE (Australia)
1 2 2 1 KARAK UYLYU (Uzbekistan). LOKOL AWEWA (Sri Lanka) (see Sequential Words)
1 2 2 1 BAGGA TELLE. LERRE IPOOP. MIRRLNESSE
1 2 1 2 - BUBUR LOLON (E. Timor). TATAS IRIRE (Guatemala). DUDUG HAHAO (Solomon Is.)
1 2 - 12 PROPR IETIE. SICSI BANDBA (Peru) (see Sequential Words)
1 - 2 1 2 PYOPO JESIS (web2)

12-LETTER WORDS (45)
1 2 1 2 - MUMURI CHCHAN (Sri Lanka). NINILVAYAYEM (Russia)
1 2 - 12 - BAMBAD OUGOUS (2 places called Bambadoucou in Ivory Coast and Guinea)
1 - 1 2 12 FANTAN BOUGOU (Malta). JEUMEU RANGAN (Indonesia). HOTNOT SWERWE (S. Africa)
1 2 2 1 STOPPO GIEDDE (Norway). VUOLLO SJAKKA (Norway)

14-LETTER WORDS (105)
1 - 2 2 - 1 KALLVIK SUDDENS (2 places called Kallvikssudden in Finland and Sweden)
1 - 12 - 21 SEROREA CTIVITY?
1 - 2 1 2 - 1 BATUPUT IHKENEK (Indonesia)
1 2 - 1 2 12 PEUTEUY CONDONG (Indonesia)

3 OR MORE DIFFERENT LIKE LETTERS IN EACH HALF

These two 12-letter locations have 3 different like letters in each half of the word:
1 2 3 1 2 3 PEPEPEO CHICHI (Solomon Is). SENSEN KWAKWA (Ghana)

Although not exploring words with 16 letters, I did chance upon a word which has 4 different
like letters in each half: 1 2 3 4 1 2 3 4 REBUREBU SIWASIWA (Papua NG)

The above three examples are sequential words.

3-WAY INTERNAL ISOMORPHS

3-way internal isomorphs are only to be found amongst words having a multiple of 3 letters. This
means that possible word lengths include 6, 9, 12, 15, 18, 21 etc. letters. Hence, unlike their 2-
way counterparts, these include words with an odd number of letters.

Constructed of 3 doubled letters, FF OO TT, with the letter pattern 11.22.33, will be familiar to
many readers of Word Ways. AGAMEMNON words, however, must surely be the best-known of
the 3-way examples with their triple palindromic letter pattern 121.343.565.

Three-way internal isomorphs also include MCC ONN ELL (surname). ATT IKK ULL (Sri Lanka), and
GAA LOO TII (Somalia). all with the letter pattern 122.344.566

INTERNAL ISOMORPH SHIFTS

Can the letters of internal isomorphs be shifted along the alphabet (looping from Z to A) to form other
internal isomorphs? A search of the many MEM NON words (those with the letter pattern 121.343 - see
earlier in article) revealed the following example of just such an internal isomorphic shift:
LIL NYO (Tanzania) + 6 = ROR UEU (Brazil)