## The Art of Crossword Construction

William Johnston • 26 January 2010 Newton Community Education

## Themes in Crosswords

Themes are typically used to structure American crosswords. The longer entries in a puzzle are connected by some kind of wordplay or semantic relationship. Other entries in a puzzle are usually not affiliated with the theme, although sometimes a small word that explains the theme may be included, often near the bottom. If a puzzle has a title, it may provide a clue to the theme.
Themes provide a help to the solver, because they cross all areas of the puzzle and help the solver fill in the grid. Usually there are 3,4 , or 5 theme entries, and they are often 10-15 letters long.
Because crossword grids have rotational symmetry, theme entries must be found that have matching lengths, so they can be placed opposite each other in the grid.
Below are some simple kinds of themes. The examples are drawn from puzzles published by constructors in the CrosSynergy syndicate in the Washington Post.

## First words link entries

Theme entries are often multiple-word phrases. Sometimes the first words of these phrases are connected in some way. They may be synonyms, or they may all be words that can be linked with one other word to form familiar phrases.
"Non-Stop" by M. Ashwood-Smith PERPETUAL MOTION
ENDLESS SUMMER
ETERNAL TRIANGLE


"By Gum!" by Patrick Jordan CHEWING OUT
ART FLEMING
SPIRIT AWAY
BUBBLE WRAP

"Loose Ends" by Harvey Estes CHANGE KEYS LEAF THROUGH CANNON FIRE FITTING ROOM

"Hare Force" by William Johnston DUST BUSTER
SNOW TRAIN
PLAYBOY MAGAZINE
EASTER EGG
FUNNY PAGES

## Last words link entries

The last words of multiple-word phrases can likewise form the basis of a theme. Here too, there may be a "missing link" word that connects all the final words to form familiar phrases.

"Moan * Groan" by Paula Gamache BOBTAIL NAG FIDDLER CRAB CHIPPED BEEF SAGE GROUSE

"In the News" by Rich Norris FIRST STORY
SPINAL COLUMN
JOINT ACCOUNT
LOUD REPORT

"-Fold 'Em" by Bob Klahn TELEPHONE BILL
COMMUNITY CENTER
VENETIAN BLIND


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## Hidden words

Theme entries may contain hidden words, often spanning the word breaks. The theme entries will not otherwise be related. In these puzzles, the hidden word is usually referred to in the title or included as an entry by itself in the puzzle.

"Inland Resort" by Rich Norris TEXASPANHANDLE CHRISTMASPARTY BENEFITSPACKAGE BORISPASTERNAK SEMIGLOSSPAINT


## Add or subtract something

A letter or cluster of letters may be added or subtracted from idiomatic phrases.
The resulting non-idiomatic phrases are clued. It is usually easier to see when letters have been added. When letters are subtracted, the title of the puzzle may help the solver guess what has been removed.

"'S Wonderful" by William Johnston STALL ORDERS STRAIN TRACKS STAKEOUT FOOD sTOP BILLING

"O, O, Annette" by Mel Rosen
[]ARROWGAUGE
[]UMBERCRUNCHER
[]EUROBIOLOGIST
[]ETHERLANDS

"The Midas Touch" by Paula Gamache A CIVIL AUCTION WRITING PAUPER MAGNETIC TĀUPE CARPENTER AUNT

"Pain Relief" by Patrick Jordan YELL[]JACKET
PILL[]FIGHT
WIND[]BLIND
SHAD[]BOXING

"Copper Heads" by Bob Klahn
CURATE OF SPEED
CUBEDBUG
CUTIEBAR
CURED SOUIRREL

"Drop In Anytime" by Sarah Keller M[]UTE WALTZ HOUSE PA[]TER STANFORD-B[]ET TEST DIV[]E COMEDY CAN[]E CORPS

"Monday Kickoff" by R. J. Hartman MONK RATION
MONGOOSE NECK MONARCH ENEMY MONKEY CLUB

"Bug-Free" by Mel Rosen GI[] TORTOISE PLEAS[]VILLE
MOST W[]ED LIST
FIRST SERGE[]
CH[]ILLY LACE

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"W-here We Go" by Thomas Schier WRINGS TRUE WREST IN PEACE WRIGHT YOU ARE WRAP ARTIST

## Homophones and puns

A theme may be constructed around homophones (words that sound alike) or puns. For this kind of puzzle to be successful, the type of homophone or the subject of the puns should be consistent among all the theme entries.

"Ott Couples" by R. J. Hartman
CATTY SHACK
BETTING PLANT
HASTY PUTTING
ROSE MATTER

"Send in the Clones" by R. J. Hartman RAZER RAZOR ROOMER RUMOR TOOTER TUTOR MINER MINOR

## Resources for Making Puzzles

## Software

Once you have a theme idea, there are several software tools available to help you in creating a puzzle grid and filling it with words and phrases.
Crossword Compiler (Windows)
http://www.crossword-compiler.com
Cruciverbalist (Macintosh OS Classic)
http://www.tucows.com/preview/206066
Crossfire (Java)
http://beekeeperlabs.com/crossfire
Across Lite (for .puz files)
http://www.litsoft.com
http://www.litsoft.com/across/alite/macman/aformat.htm

## Grid Ideas and Word Lists

If you need an idea of what grids will accommodate your theme entries, or you want access to some lists of words and phrases that are useful for completing fills, then the following online resources are a good place to look.
Cruciverb Constructor's Forum
http://www.cruciverb.com
National Puzzlers' League
http://www.puzzlers.org

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180-degree symmetry: the diagram looks the same upside down. All typical crosswords have this feature.


90-degree symmetry: a quarter turn maps the grid onto itself.

| S | W | U | M |  | M | A | F | I | A |  | M | A | S | T |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| H | 0 | P | 1 |  | E | L | E | C | T |  | A | L | P | O |  |
| O | 0 | P | S | 1 | D | I | D | I | T | A | G | A | 1 | N |  |
| U | S | E | R | S |  | B | $\bigcirc$ | N |  | V | 1 | N | C | E |  |
| T | H | R | E | E | R | I | N | G | B | 1 | N | D | E | R |  |
|  |  | P | A | R | D |  |  |  | A | L | O | T |  |  |  |
| G | R | A | D | E | S | E | P | A | R | A | T | 1 | O | N |  |
| H | A | L |  |  |  | F | O | X |  |  |  | P | H | 1 |  |
| 1 | M | A | L | 1 | T | T | L | E | T | E | A | P | O | T |  |
|  |  | T | A | D | A |  |  |  | N | A | T | E |  |  |  |
| C | H | 1 | N | E | S | E | L | A | N | T | E | R | N | S |  |
| L | 0 | N | G | A |  | L | U | G |  | A | L | G | 1 | A |  |
| 1 | N | A | L | L | D | I | R | E | C | T | 1 | O | N | S |  |
| N | 0 | T | E |  | R | H | 1 | N | 0 |  | E | R | N | E |  |
| G | R | E | Y |  | J | U | D | A | S |  | R | E | Y | S |  |

Mirror symmetry in two axes: a horizontal axis and a vertical axis.

| S | L | 1 | T |  | A | S | H | E | S |  | T | R | A | M |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| P | 1 | T | H |  | C | L | O | U | T |  | A | U | R | A |
| E | V | E | R |  | C | A | $P$ | R | A |  | K | H | A | N |
| D | E | M | O | L | 1 | T | 1 | O | N | D | E | R | B | Y |
|  |  |  | W | A | D |  |  |  | D | E | A |  |  |  |
| B | U | S | 1 | N | E | S | S | P | A | R | T | N | E | R |
| A | T | A | N |  | N | O | P | A | R |  | F | 1 | X | E |
| S | A | L | T |  | T | R | 1 | E | D |  | A | C | T | A |
| S | H | A | H |  | R | E | E | S | E |  | C | A | R | D |
|  | N | D | E | P | E | N | D | E | N | C | E | D | A | Y |
|  |  |  | T | U | P |  |  |  | G | O | V |  |  |  |
| 0 | U | T | O | F | O | N | E | S | L | E | A | G | U | E |
| G | N | A | W |  | R | A | D | 1 | I |  | L | U | N | G |
| E | 1 | R | E |  | T | 1 | N | T | S |  | U | S | D | A |
| E | T | A | L |  | S | L | A | S | H |  | E | T | O | N |

Mirror symmetry in four axes: a borizontal axis, a vertical axis, and both diagonals.

## Grid Pattern Conventions

The grid is the pattern of black and white squares that the solver fills in. You can use graph paper or computer software to help design and fill crossword grids.

## Grid features

Grids are almost always square.
Grids usually have an odd number of squares on each side. Common sizes for grids are $15 \times 15$ for weekday puzzles and $21 \times 21$ for Sunday puzzles.
The maximum word count in a $15 \times 15$ themed puzzle is 78 words.
No more than about $1 / 6$ of the squares in the grid should be black.
Every white square in the grid must appear in an Across and a Down word.
The black squares of the grid must not divide the puzzle into unconnected areas.

## Grid symmetries

The pattern of black squares must have 180 -degree symmetry. That is, if you turn the diagram upside down, it looks the same.
In addition to 180 -degree symmetry, some puzzles also have 90 -degree symmetry. In addition to 180-degree symmetry, some puzzles also have mirror symmetry.
On rare occasions, a puzzle will have mirror symmetry only, without 180-degree symmetry.

## Things to avoid in grids

Two-letter words are not allowed in standard puzzles.
Avoid having too many three-letter words. A maximum of 8-15 three-letter words is ideal.

Avoid "cheater" black squares added just to make filling the grid easier. If a black square can be removed without changing the total number of words in the grid, it is a cheater, unless it is required for thematic reasons.
Avoid large clumps of black squares.
Avoid having just one entry as a mode of access into a region of the grid. Solvers should have two ways of getting into every region. This guideline is violated in the top diagram shown at the left.

## Grid Activity

The following grids are unacceptable for different reasons. Can you explain why each grid fails to meet the typical requirements for a puzzle?


Diagram A


Diagram B


Diagram C


Diagram D

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Phase 1: The theme entries must be placed first, in symmetric locations. Black squares are built around them.


Phase 2: The longest Down entries are filled in, especially those that cross more than one theme entry.


Phase 3: The left, right, and center regions are filled.


Phase 4: The top and bottom regions are filled. Only the corners remain.

## Filling the Grid

The fill is the collection of words and phrases that are the answers in the grid. The fill should use common words rather than obscure ones. A puzzle is made hard by clever clues, not by including obscure words. Computer software can help you find legitimate fills.

## Fill sequence

The diagrams at the left show a typical sequence for finding a fill.
The theme entries are placed first, and black squares are built around them that conform to standard grid requirements.
Once the theme entries are in place, look for other longer words in the diagram, especially those that cross through more than one theme entry. These need to be chosen early to ensure that a fill is possible.

Smaller words are filled later, region by region.

## Things to avoid in fill

Avoid too many "crossword-ese" words that appear over and over in puzzles, such as ESNE, IOTA, ORCA, and so on.

Avoid obscure or obsolete words. Avoid made-up words or phrases.
Avoid death, disease, and other unpleasant topics. Puzzles are sometimes used as an escape, and should not remind solvers of their troubles.

Don't use too many abbreviations as entries.
Don't include too many proper names.
Don't have too many entries that will require fill-in-the-blank clues.
Don't strain to get every letter of the alphabet in. Letters like Z, K, Q, J, and F are rare and fun to see in puzzles but getting them all in may lead to bad quality fill.

## Fill Activity

The four corners of the puzzle shown at the left are reproduced below. Can you find a fill for one or more of these corners?


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## Tricky Clue Activity

Can you solve these clues?
The question marks at the end indicate these are tricky clues.

Pole star?
$\underline{S_{-}} \underline{N} \underline{A}_{-} \underline{L_{-}} \underline{U}$
Old tool for working on logs?
_ $\underline{L}_{-} \underline{D}-\underline{R}-\underline{L}$
Where mates are often found?
_ $\underline{N} \underline{D}$ _ $\underline{A}$ _ $\underline{S}$
Blessed events?
_ $\underline{N}_{\sim}$ _ $\underline{Z}_{-}$
Takes back the lead?
E _ _ $\underline{S}$ _ -
Spoke more than once?

-     - _ I I

Bring up the rear?

- 0 O

Scratch post?

- I _


## Writing Clues

The clues in a puzzle are what the solver uses to discover the answers. You will find that certain conventions apply to clues in puzzles.

## Rules for clues

The part of speech of a clue must match the part of speech of the answer.
Clues should be accurate, but they may be deceptive.
Clues should be short, since there are space limitations in newspapers.
If an answer is an abbreviation, the clue should include an abbreviation itself as a cue, or include "(abbr.)" at the end.
If an answer is a common word from a foreign language, the clue should usually use a reference to that language within its wording.
Difficult entries should have easy clues, or they should be crossed by words that all have easy clues.

The level of difficulty of clues should be appropriate for the venue of the puzzle and the day of the week it will appear.

## Varieties of clues

Straight definition: Most crossword clues are simple definitions of their answers. Alliteration or rhyme: Clues can use alliteration or rhyme to avoid monotony. Fill-in-the-blank: Some entries can only be clued with a fill-in-the-blank phrase.
Trivia: Solvers enjoy learning new things, so an interesting fact that can clue a common answer in a fresh way is usually welcome.

Punny or tricky: A question mark often indicates that the solver needs to view a clue in a non-standard way to solve it.
Humorous: Solvers welcome offbeat clues to words.

## Clue variety

You can see from the examples below that it is possible to write clues of different varieties or difficulty levels for the same word.

Genesis garden
Paradise
Idyllic spot
Jeannie portrayer Barbara 1950s British prime minister Steinbeck's "East of ___"

Temptation location Fall locale First place?
Sandwich cookie
Nabisco treat
Hydrox alternative
Snack since 1912
Stackable snack
Dunkable dessert
Round of snacking?
Food that's been kosher
since 1998
It may get a licking after
dinner

Run off to wed Split to unite Get bitched quick

Run for your wife? Take the honey and run? Bolt together?

What running mates do? Take part in a secret joint venture?
Choose the window instead of the aisle?

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Clues for a puzzle are submitted to an editor in a simple double-spaced format, with answers at the right.
<ACROSS PUZZLE>
<TITLE>
"Sunday Challenge"
<AUTHOR>
By William I. Johnston
<COPYRIGHT>
2010 William I. Johnston
<SIZE>
$15 \times 15$
15X15
<GRID>
.CSTAR.LETSLIP.
FAEROE.EDIFICES
ARMANI.ADMONISH
REPPED.VIE.ECTO
ESE..SPEED.ULEE
AFROS.LII.APERS
SOFTPRETZEL....
TRIBECA.ZIGZAGS
....LABRADOODLE
KNOLL.AIR.LODEN
NANA. ARCDE. .WAN
ICER.UGO.SLOANE
SHOOTSAT.SESTET
HOUSESIT.ASSERT
. STAMINA. YEARS.
<ACROSS>
Red giant with an abundance of carbon
Inadvertently reveal
Denmark's Islands
Grand buil dings
A .txt file like this one can be opened within Across Lite and saved as a .puz file for online presentation.
The periods in the grid section indicate black squares.

## Preparing for Publication

If you want a puzzle to be published in a newspaper or magazine, you will need to submit it either via e-mail or regular mail to an editor. Payment varies depending on the publication and the size of the puzzle.

## Submitting puzzles to editors

Different editors have different requirements for manuscript submissions. Refer to the style sheet information and mailing addresses available at www.cruciverb.com.
If you are submitting manuscript, clues and answers need to be presented in a large font, double-spaced.
The time between submission and response can be as little as a week or as much as six months.
Clues are very often rewritten by editors, usually to adjust the difficulty level. Anywhere from $25 \%$ to $75 \%$ of the clues may be changed.
The theme or fill of a puzzle is very rarely changed, although sometimes an editor will ask you to rework an area of a puzzle and re-submit it.

## Creating puzzles for online presentation

If you want to make your puzzles available online, the ".puz" file format is one way to do it. The free Across Lite program allows people to open, solve, or print puzzles.
You can build a special ".txt" file using any word processor, and if you use the appropriate format in this file, you can open it in Across Lite and save it as a .puz file to be delivered online.

## Across Lite software

http://www.litsoft.com
Across Lite .puz file text format
http://www.litsoft.com/across/alite/macman/aformat.htm

## Books

Patrick Berry. Crossword Puzzle Challenges for Dummies.
ISBN: 0-764-55622-3
Stan Kurzban and Mel Rosen. The Compleat Cruciverbalist.
ISBN: 0-442-25738-4

## Will Johnston URLs

http://www.fleetingimage.com/wij/xyzzy/nyt-links.html
mailto:wij@theworld.com

## Answers to Activities

## Grid Activity

A. Four squares do not have both Across and Down words going through them. Unchecked letters are not allowed.
B. There are four 2-letter entries.
C. The diagram does not have 180-degree symmetry.
D. The diagram has 80 entries. The maximum word count for this puzzle size is typically 78 entries.
Tricky Clue Activity SANTACLAUS, SLIDERULE, ENDGAMES, SNEEZES, ERASES, RADII, MOON, ATM

