Naked Candidates

From sudokuwiki.org, the puzzle solver's site

'Naked' in this context refers to all the remaining possible candidates on a cell which are going to be used in a strategy. The simplest such situation is a Naked Single - or the last remaining candidate on a cell. Generally speaking, if you are making notes on a Sudoku board you have reached a point where simple scanning of the rows, columns and boxes has brought you no further solutions. But you will be finding plenty of Singles on the easier puzzles, and hopefully not too few on the hardest ones.

A Naked Single is exactly equivalent to saying "Ah Ha! Looking at that cell, I can see every other number either in the same box, the same row or the same column, so it's the only number that can fit."

Hidden candidates, mentioned below with regard to Pairs and so on, also have a Hidden Single equivalent. It occurs when you find a cell with lots of possible candidates, but you reason "well, X can't go anywhere else in either the row, column or box, so it must go here."

Naked Pairs

A **Naked Pair** (also known as a **Conjugate Pair**) is a set of two candidate numbers sited in two cells that belong to at least one unit in common. That is, they reside in the same row, column or box.

It is clear that the solution will contain those values in those two cells, and all other candidates with those numbers can be removed from whatever unit(s) they have in common.

In this example, several Naked Pairs are available and I have highlighted two. In red in row A, cells **A2** and **A3** both contain 1 and 6. We don't know which way round the 1 and the 6 will eventually be - we will find out later as we finish the puzzle - but it means we can remove all other 1s and 6s in the row. The solver has highlighted these candidates in yellow. But **A2** and **A3** are also in the same box, so we can clear off the 1 in **C1** as well.

The [6,7] in row C is also a Naked Pair. It is aligned just in the row, but it removes three other candidate 6s and 7s in the row. Combining both Naked Pairs, we get a solved cell of 8 in **C1**.

There are other Naked Pairs at this point. You can identify them yourself or load the puzzle up in the solver to see them.

Naked Pairs examples : *Load Example* *or :* *From the Start*

Just to show that pairs don't have to be aligned on a row or column, in this group of pairs we have a [4,7] pair on **H2** and **J1**, which removes some 7s in the same box. Two other Naked Pairs eliminate further candidates at this stage.

Figure 2 : *Load Example* *or :* *From the Start*

Naked Triples

A **Naked Triple** is slightly more complicated because it does not always imply three numbers each in three cells.

Any group of three cells in the same unit that contain IN TOTAL three candidates is a **Naked Triple**.
Each cell can have two or three numbers, as long as in combination all three cells have only three numbers.
When this happens, the three candidates can be removed from all other cells in the same unit.

The combinations of candidates for a Naked Triple will be one of the following:

(123) (123) (123) - {3/3/3} (in terms of candidates per cell)
(123) (123) (12) - {3/3/2} (or some combination thereof)
(123) (12) (23) - {3/2/2/}
(12) (23) (13) - {2/2/2}

The last case is interesting and the advanced strategy Y-Wing uses this formation.

This first example is as straightforward as it gets. In row E, centre box, are the cells **E4**, **E5** and **E6** containing [5,8,9], [5,8] and [5,9] respectively. In total, those three cells contain [5,8,9], so we have fixed those numbers in those cells - just not which way round they will be. This allows us to remove those numbers from the rest of the unit the Triple is aligned on - namely the row.

Naked Triple : Load Example or : From the Start

We have two Naked Triples at the same time on this board, in columns 1 and 9. There is no trickery in these Triples because the cells that form the triples are the last three unsolved cells in those columns - so they are bound to contain the three remaining values. Given that fact, we can clear out those values from each box containing a Naked Triple (and

only the box, since there is nothing to clear off in the columns). But the manoeuvre nets us a great deal of candidates and we get a solution of 9 in **F8**.

In terms of the candidates per cell, the column 1 triple is a {2/2/3} formation (reading down) and the second, column 9, is {3/2/3}.
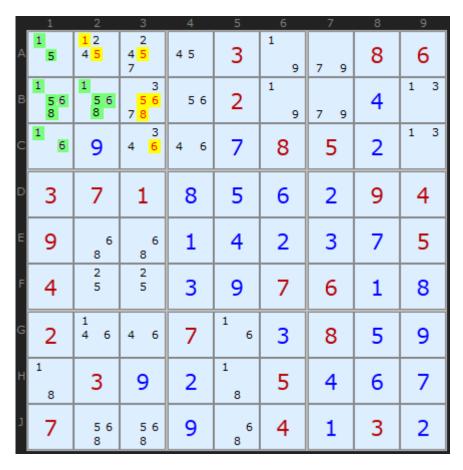
Naked Quads

A **Naked Quad** is rarer, especially in its full form, but is still useful if it can be spotted. The same logic from Naked Triples applies, but the reason it is so rare is because if a Quad is present, the remaining cells are more likely to be a Triple or Pair and the solver will highlight those first.

Well, I can't find an example in my 2012 stock, so I'm going to use the one found by Pieter from Australia. It's a cluster of cells in box 1. **A1**, **B1**, **B2** and **C1** collectively contain [1,5,6,8], so those numbers must occupy those cells. That allows us to remove the yellow highlighted candidates.

Naked Quad example : Load Example or : From the Start

We don't consider higher orders of Naked candidates because there are only 9 cells in a unit. So if we were to suppose a "Naked Quin" with five candidates there would automatically be a complimentary Naked Quad since 5 + 4 = 9. Same point arises with Hidden sets. It may be viable to look for such beasts in 12x12 or 16x16 Sudokus.

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