

Beginners' Sudoku, With Examples

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with thanks to Sheldon Brown & The Ventura Breeze for the use of their Sudoku puzzle
and to Sheli Ellsworth for editorial help

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This article is 22 pages long. You may want to print only page 2 through page 13 now, and print the step-by-step puzzle solution pages 14-22 later.

Summary

It's fun to solve a Sudoku puzzle, and it exercises the mind's logic skills and memory ability. Math knowledge isn't needed, just the ability to recognize the patterns that determine which number can be placed into which cell without violating the simple rules of the game. A large supply of puzzles is available; they are free online, and most newspapers have new puzzles frequently. Puzzles come in varying degrees of difficulty, so it's possible to develop the basic skills (and have fun) with the easy puzzles, and then progress to harder puzzles as desired. Numerous books and websites have helpful information for beginners. This article is about easy puzzles only, but the principles are applicable to all levels of difficulty. Graphics are used liberally to illustrate the concepts.

The article first describes the Sudoku puzzle, the definitions of the parts of the puzzle, the rules of Sudoku, the concept of influence, and the overall solution process.

Next, the three reasons for putting a number into a cell are explained. These reasons are:

1. It's the last number in the row, or in the column, or in the block,
2. It's the only cell for the number,
3. It's the only number for the cell,

and each of these reasons is illustrated with puzzles.

The use of little numbers to process candidate numbers is explained.

The idea of "balance" is presented. Balance is a way to catch errors in the solution process as they occur (and not at the end of the puzzle).

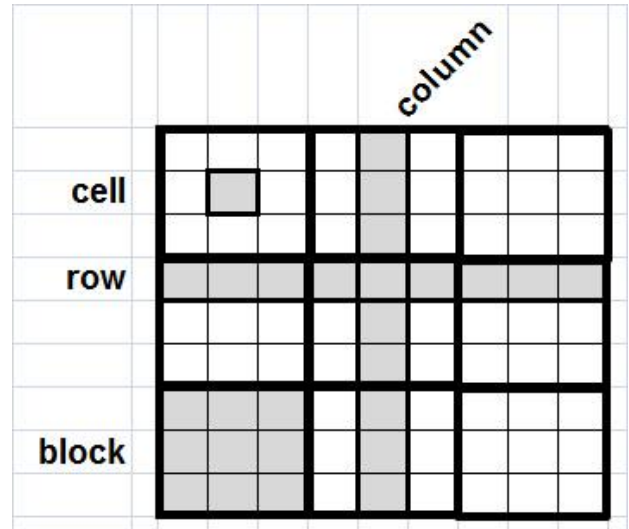
The article concludes with an easy puzzle, courtesy of Sheldon Brown, the Editor of The Ventura (CA) Breeze newspaper, solved step-by-step, with the rationale given for the number placement made at each step. The more difficult steps have additional notes to enhance understanding.

By the end of this article, the reader should have a good enough understanding of Sudoku to begin to work easy puzzles successfully.

Introduction

The Sudoku puzzle

The Sudoku puzzle is a 9 by 9 array of cells partially populated with numbers called “givens” or “clues”. Solving the puzzle populates the rest of the cells with numbers, without violating the rules of Sudoku. There’s no math involved in solving the puzzle; the numbers 1 through 9 are just symbols for 9 unique items. Instead of numbers, it could be 9 unique dog breeds, but it’s probably too hard to write “afghan wolfhound” into a tiny little cell.



Sudoku definitions

The definitions used in Sudoku are not standardized. The names used in this article for the parts of the puzzle are shown in the figure at right. There are 81 cells, 9 rows, 9 columns, & 9 blocks.

Sudoku Rules

Each row, column, and block must contain the numbers 1 through 9 without repetition.

So if you write a 5 into a row that already has a 5, the game is lost. You’re unlikely to do that at the start of a puzzle, but it can occur near the end, when the only place to put a 5 is a row, column or block that already has a 5 in it. Putting the wrong number into a cell oftentimes is a problem that won’t appear until later. You can avoid this problem by doing four things **every time** you write in a number:

- 1 Always have a good reason for choosing which number to put into a cell. As will be shown later, there are only three reasons to place a number in a cell.
2. Always double check that you’ve written the number into the cell you intended to put it in. This error happens when you get into a hurry.
3. After you’ve placed a number into a cell, check its row, column, and block for duplication.
4. Check the “balance”, described later.

It is never necessary to guess

Influence of one cell upon others

Every cell is a part of a row, a column, and a block, i.e., the cell has an influence on 20 (8 + 6 + 6) other cells. Imagine that combination of cells as a keep-out zone. For example, if you're thinking about putting a 5 into the puzzle shown at right, don't put it into the grey keep-out zone, because then there would be two 5's in a row, or column, or block, thus violating the rules.

influence		5							

Because then there would be two 5's in a row, or column, or block, thus violating the rules.

Influence works both ways. A number in the grey cells influences the cell with a 5 in it, and the cell with a 5 in it influences all the grey cells.

The Solution Process

It's not always about what you can do. It's oftentimes about all the things you can't do, and what's left, you do.

When you can look at a number and know that it can't go into any other cell, or look at a cell and know it can't hold any other number, then you can be confident that your choice is good. In this article, these two situations are called "only cell" and "only number", explained in detail in the next section.

There has to be a solid reason for the choice; anything else is a guess, and guesses almost always end badly.

Most people fill in their choices in pencil, and they keep an eraser handy. There's a reason for that.

Making mistakes is not uncommon. Sometimes it's caused by inattention, or sloppiness, or just fatigue. Be ready for it, and know everybody does it. Maybe it's time for a walk.

The Three Reasons To Put A Number Into A Cell

1. It's the **last number** in the row, or in the column, or in the block.

The good news is that this situation is extremely easy to spot. The bad news is this “last number” case usually happens near the end of the whole solution process, and always happens at the very end. So it's no help early in the process, when you need it most.

		1							
last number		3							
		4							
		2							
5 is last in column		5							
		8							
		6							
		7							
		9							

last number									
	1	2	3	4	5	6	7	8	9
5 is last in row									

last number									
	1	2	3						
5 is last in block	4	5	6						
	7	8	9						

In the figures above and to follow, only the cells important to the decision are shown. In practice, the puzzle will be populated with lots of numbers, so recognizing the pattern will be more challenging.

The number being placed will be shown in **blue**.

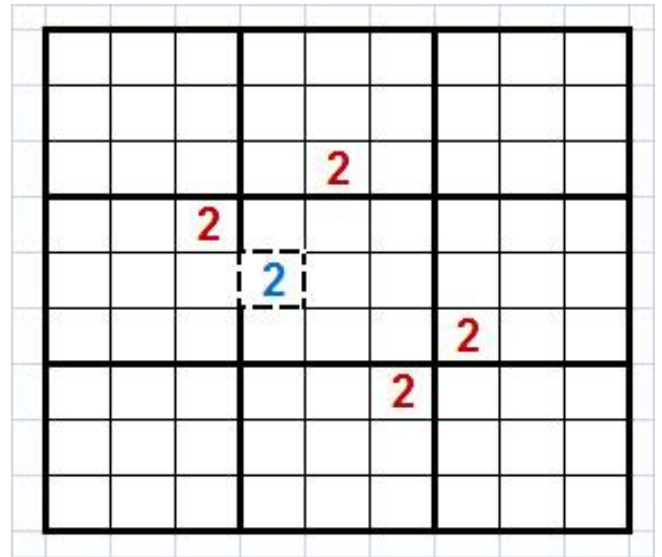
2. It's the **only cell** for the number.

The figure shows the situation for a cell in the middle block. The red numbers are the numbers already in the puzzle. They are the “drivers”; their influence forces the choice for the middle block.

The placed number, a blue 2, has to go into the cell shown. If the 2 were placed in any other cell within the middle block, it would be a redundant 2 in a row or column, and would thus violate the rules of Sudoku.

Sometimes this case is called “only cell” for brevity.

This situation usually occurs at the start of the solution process, and near the end.

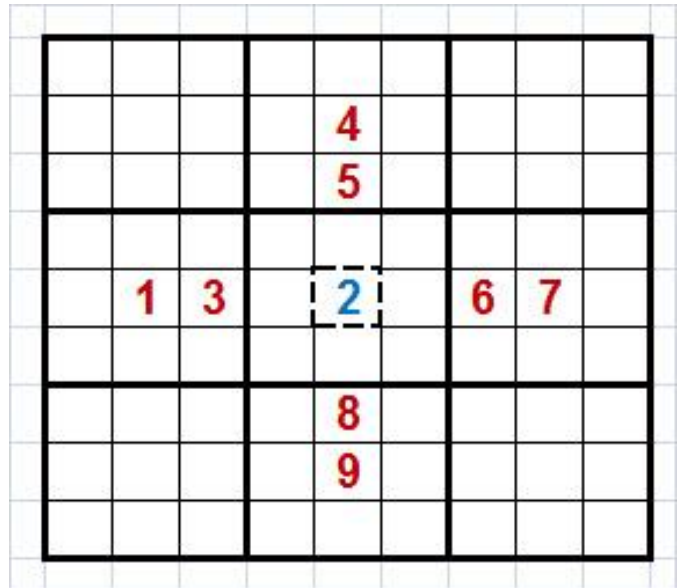


3. It's the **only number** for the cell.

In this example, the red numbers drive the choice of number for the middle cell of the middle block. The blue 2 is the only number that can go into the cell and not duplicate the number in the center row or center column. Once again, the red numbers already in the puzzle are the drivers influencing the choice.

Sometimes this case is called “only number” for short.

This situation occurs in the middle of the solution process.

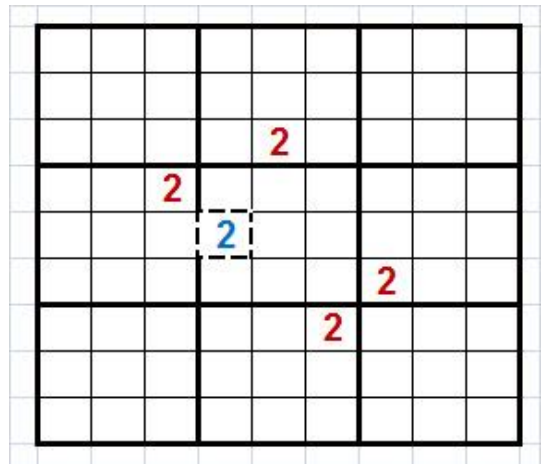


**The only cell for a number
is not the same
as the only number for a cell.**

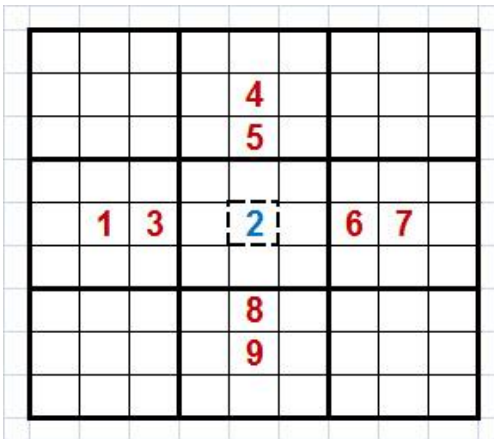
Context

To completely describe the rationale for placing a number, it is necessary specify both the type of influence, and it's geometry.

For the “only cell” example shown at right, it's a case of the only cell for the number in the context of the block. Or more simply, **the only cell for the number in the block.** (see Step 2 in the solved puzzle). This also called **the only cell in the block for the number.**



The other “only cell” situations are
the only cell for the number **in the column**, (see Step 1) and
the only cell for the number **in the row**. (see Step 7)



In the “only number” example shown at left, it's a case of **the only number for the cell in the block.** (Step 9), or **the only cell in the block for the number**

Other “only number” situations are
the only number for the cell **in the column**, (Step 14)
and
the only number for the cell **in the row**. (Step 12)

Placement Rationale Description

To recap, when placing a number in an “only” situation, it will be a case of either

An **only cell** situation or an **only number** situation

plus

the choice of **in the row**, **in the column**, or **in the block**

For easy Sudoku puzzles, there are at most four numbers missing in a row, column, or block, so it's possible to mentally keep track of the missing numbers. (Yes, it gets easier with time.) For beginners, writing little numbers for the candidates is probably the easiest path, as discussed next.

Little numbers in a cell

The figure at right shows an expanded view of a block of a puzzle. The numbers 3, 4, 6, & 7 have already been placed in cells. The upper right cell (the “open cell”) is awaiting placement of a number. In order to keep track of all the viable candidates, the puzzle solver has penciled in the candidates, using small numbers. Notice that 3, 4, 6, & 7 don’t appear among the little numbers; they already influence the open cell.

3	7	1	2	
			5	
			8	9
				6

The open cell belongs to a row, column, and block. When a new number choice is added into that row, column, or block, that number is removed from the choices shown in the open cell. Some people remove the little number by erasing it, other people cross through the number, to keep track of history.

Eventually, as the other numbers in the puzzle are placed, the correct choice for the other cells will become apparent, as explained next.

Little Numbers – Only cell for the number case

Within the block at right, the number 2 has been crossed off in the eight cells influenced by 2s. Only one cell can hold a 2. The same sort of thing will occur in a row or column. As the little numbers are crossed out, hunt for the **single occurrence of a number within a row, block, or column**. That one occurrence has to be the right number for the cell in the row, block, or column.

			2		
2	1 2 3	1 2 3	1 2 3		
	4 5 6	4 5 6	4 5 6		
	7 8 9	7 8 9	7 8 9		
	1 2 3	1 2 3	1 2 3		
	4 5 6	4 5 6	4 5 6		
	7 8 9	7 8 9	7 8 9		
	1 2 3	1 2 3	1 2 3		2
	4 5 6	4 5 6	4 5 6		
	7 8 9	7 8 9	7 8 9		
			2		

Learning to spot this situation may take some effort initially

Little Numbers – Only number for the cell case

There's one cell in the block at right that has eight of the nine numbers crossed off. Only the number **2** is possible there. The same sort of thing will occur in a row or column, i.e., anywhere in the puzzle.

As you cross off numbers, look for a cell with **all numbers but one crossed out anywhere in a block, row, or column**. That's the number for the cell.

This situation will be extremely easy to spot.

			4					
			5					
		1 2 3 1 2 3 1 2 3						
		4 5 6 4 5 6 4 5 6						
		7 8 9 7 8 9 7 8 9						
1	3	1 2 3 1 2 3 1 2 3					6	7
		4 5 6 4 5 6 4 5 6						
		7 8 9 7 8 9 7 8 9						
		1 2 3 1 2 3 1 2 3						
		4 5 6 4 5 6 4 5 6						
		7 8 9 7 8 9 7 8 9						
			8					
			9					

The Danger of Little Numbers

It's important to be careful to write all the candidates into an empty cell. For example, suppose there are 6 candidate numbers for a cell, 1, 2, 3, 4, 5, & 6, but only five of them get written into the open cell. Let's say the 6 is left out. As the solution progresses, numbers get crossed out, until only one candidate, the 5, is left. That candidate gets written in. But the 6 was also a good candidate, and in fact may be the correct one, not the 5. It's not a wrong for certain, but there's only a 50-50 chance that the right number was chosen. If it's the error situation, that error won't be immediately apparent, but it will be later, for sure.

To avoid this problem, either double check all the candidate choices in each open cell before starting the solution process, or, after placing a number into a cell, make sure the other eight numbers all have influence of the cell. Or do both.

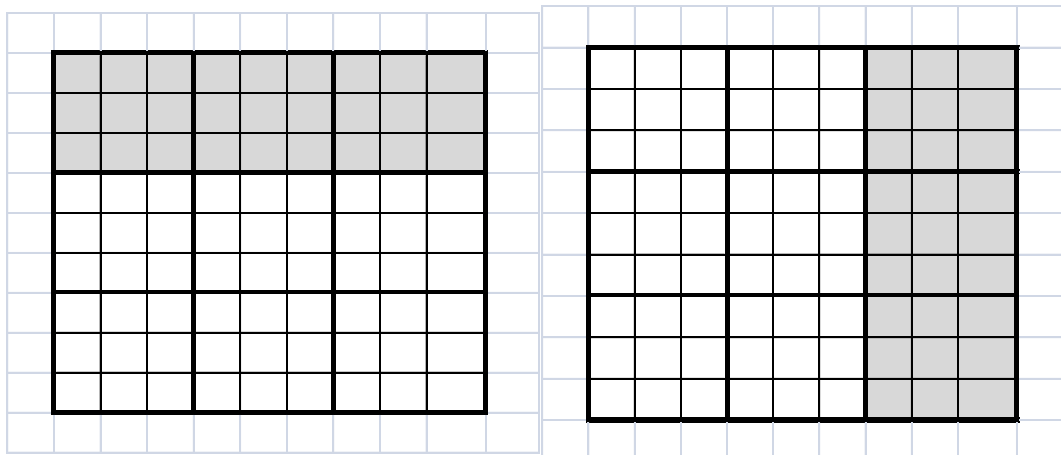
Patience

For most people, the process for solution becomes easier with practice. For example, in the beginning, when you're doing "only number" searches, it's necessary to count from one to nine to tell which numbers are missing. That takes concentration and memory. Then one day, you look at a block or row or column where one number is missing, and you just know what the missing number is. It doesn't happen all the time, but it's seems like your brain decides you're going to do doing this a lot, and some circuitry inside stays set up for next time. And you'll begin to see only cell or only number situations automatically. Everybody's different, so give it a while.

Also, if you get stuck and can't find your next move, just quit. When you come back to the puzzle, almost always you'll see the move immediately.

A few more definitions

Three blocks side by side horizontally are called a band. Three blocks side by side vertically are called a stripe (like the highway centerline).



Balance

It's discouraging to get near the end of a puzzle and discover you've got a problem. It's better to do a little quality control all along.

When you write a number into a cell, one way to check yourself is to look for "balance".

Here's a partially completed puzzle (step 47 in the following solution). The number 4 in blue in the upper right block has just been added. The green 4's influence its block. Does it balance?

2	5	8	3	4	7	9	1	6
3	7	1		8		2	4	5
6	9	4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

In the puzzle above, look across the top band. In the left block, there's already a 4 in the **bottom** row of its block. In the middle block of the band, there's a 4 in the **top** row of the block. In the right block, the newly added number, the 4, appears in the **middle** row. So the band has a 4 positioned in the top, middle, & bottom rows of the band. The new entry "balances across" the band. If you had seen a top and two middles, for example, that would be a sign there's a problem.

Look down the right stripe. The top block has the new 4 in the **middle** column of the block. The middle block of the stripe has an existing 4 on the **right** column of its block. The bottom block has an existing 4 on the **left** column of its block. So the stripe has a 4 in the left, middle, & right columns. The new entry "balances down" the stripe. If it didn't, you've got trouble.

The puzzle balances across and it balances down. It balances.

Okay, this balance stuff seems just too hard for now. So just forget about it.

But after a while solving Sudoku puzzles, when you screw up, and you've just erased all the numbers you've so carefully penciled in, you might want to think about balance again.

Beginning Sudoku

Good luck. It may seem difficult at first. It's not, it's just unfamiliar. It's like previous things that turned out to be a lot of fun: a bicycle, a remote control, a dance step, a search engine, a smart phone. After a little effort getting started, it's kind of nice to be working on something that has concrete rules, someplace where you can just forget everything else, concentrate on one thing, and relax. Other players are usually happy to help you when you get stuck on your next placement. Remember, the only skill you absolutely need to have is the ability to count from 1 to 9, so relax.

And then you'll wonder what pairs are, what hidden pairs are, triplets, hidden triplets, x-wings, and swordfish,... There are wonderful web sites to visit.

It's interesting to see how your brain kicks in.

All that in due time. But for now, start the trip.

What follows is the complete, step-by-step solution of an easy puzzle. As before, in each puzzle the blue number is the new choice, driven by the existing red number drivers. The horse to watch is the number in blue.

There are 51 steps in the solving of the puzzle. You may not want to try to do it all at once.

The first 8 steps are “only cell” situations; after you work through them, it might be a good place to stop, rest, and read the material about “only number” situations.

this moderate difficulty puzzle is from the December 11-25 2013 issue of The Ventura Breeze	2			3			9		6
		7			8				5
			4			1		3	
	8				1				2
	4	6				9	1		
			9	7				6	
			6		9				7
		2				3		8	
	9			4	5	6			

Step 1: only cell in the column for the number 2	2			3			9		6
		7			8				5
			4			1		3	
	8				1				2
	4	6	2			9	1		
			9	7				6	
			6		9				7
		2				3		8	
	9			4	5	6			

Step 2: only cell in the block for the number 7	2			3			9		6
		7			8				5
			4			1		3	
	8		7		1				2
	4	6	2			9	1		
			9	7				6	
			6		9				7
		2				3		8	
	9			4	5	6			

Step 3: only cell in the block for the number 7	2			3			9		6
		7			8				5
			4			1		3	
	8		7		1				2
	4	6	2			9	1	7	
			9	7				6	
			6		9				7
		2				3		8	
	9			4	5	6			

Step 4:
only cell in
the block
for the
number 7

2			3			9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7					6
		6		9				7
	2			3		8		
9			4	5	6			

Step 5:
only cell in
the block
for the
number 7

2			3			9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7					6
		6		9				7
7	2			3		8		
9			4	5	6			

Step 6:
only cell in
the block
for the
number 7

2			3			9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7					6
		6		9				7
7	2			3		8		
9			4	7	5	6		

Step 7:
only cell in
the row
for the
number 7

2			3	7		9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7					6
		6		9				7
7	2				3		8	
9			4	7	5	6		

Step 8:
only cell in
the block
for the
number 4

2			3		7	9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7					6
	4	6		9				7
7	2			3		8		
9			4	7	5	6		

Step 9:
only
number in
the block
for the cell

2			3		7	9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7					6
	4	6		9				7
7	2			6	3		8	
9			4	7	5	6		

Note to step 9 : This is the first “only number” occurrence. Step 8 shows that the lower middle block has 4 open cells; it’s missing a 1, 2, 6 & 8. Influencing the center cell in the block, there’s a 1 in the column, a 2 in the row, and an 8 in the row. The only number that wouldn’t be a duplicate is the number 6.

Step 10:
only
number in
the block
for the cell

2			3		7	9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7					6
	4	6		9				7
7	2			1	6	3		8
9			4	7	5	6		

Note to step 10: The center left cell in the lower middle block could be 1, 2, or an 8. Since there’s already a 2 and an 8 in the row, they can’t be used again. So a 1 goes there.

Step 11:
only
number in
the block
for the cell

2			3		7	9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7				6	
	4	6		9				7
7	2	5	1	6	3		8	
9			4	7	5	6		

Note to step 11: The lower left block needed a 1, 3, 5 & 8. The middle row of the band already has a 1, 3 & 8, so only a 5 can go in the empty cell lest there be duplication.

Step 12:
only cell in
the row
for the
number 9

2			3		7	9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7				6	
	4	6		9				7
7	2	5	1	6	3		8	9
9			4	7	5	6		

Step 13:
last
number
for the
row

2			3		7	9		6
	7			8				5
		4			1	7	3	
8		7		1				2
4	6	2			9	1	7	
		9	7				6	
	4	6		9				7
7	2	5	1	6	3	4	8	9
9			4	7	5	6		

Step 14:
only
number in
the column
for the cell

2			3		7	9		6
	7			8				5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	
		9	7				6	
	4	6		9				7
7	2	5	1	6	3	4	8	9
9			4	7	5	6		

Note to step 14: The far right column needs a 1, 3, 4, & 8. The third row down already has a 1, 3 & 4, so only the 8 can go in the cell.

Step 15:
only
number in
the column
for the cell

2			3		7	9		6
	7			8				5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7				6	
	4	6		9				7
7	2	5	1	6	3	4	8	9
9			4	7	5	6		

Note to step 15: The far right column needs a 1, 3, & 4. The fifth row down already has a 1 & 4, so only the number 3 can go in the cell.

Step 16:
only cell in
the row
for the
number 4

2			3		7	9		6
	7			8				5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7				6	4
	4	6		9				7
7	2	5	1	6	3	4	8	9
9			4	7	5	6		

Step 17:
last
number
for the
row

2			3		7	9		6
	7			8				5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7				6	4
	4	6		9				7
7	2	5	1	6	3	4	8	9
9			4	7	5	6		1

Step 18:
only
number in
the row
for the cell

2			3		7	9		6
	7			8				5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7				6	4
	4	6		9				7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Note to step 18: the bottom
row is missing a 2, 3 & 8

Step 19:
only cell in
the block
for the
number 3

2			3		7	9		6
	7			8				5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7				6	4
	4	6		9		3		7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 20:
last
number
for the
block

2			3		7	9		6
	7			8				5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7				6	4
	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 21:
only cell in
the row
for the
number 1

2			3		7	9		6
	7			8				5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7				6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 22:
only
number in
the column
for the cell

2			3		7	9		6
	7			8		2		5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7				6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Note to step 22: The seventh column needs a 2, 5 & 8. The second
row has a 5 & 8, so to avoid duplication, the cell needs to be a 2

Step 23:
only cell in
the column
for the
number 8

2			3		7	9		6
	7			8		2		5
		4			1	7	3	8
8		7		1				2
4	6	2			9	1	7	3
		9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 24:
last
number in
the column

2			3		7	9		6
	7			8		2		5
		4			1	7	3	8
8		7		1		5		2
4	6	2			9	1	7	3
		9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 25:
last
number in
the block

2			3		7	9		6
	7			8		2		5
		4			1	7	3	8
8		7		1		5	9	2
4	6	2			9	1	7	3
		9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 26:
only
number in
the block
for the cell

2			3		7	9		6
	7			8		2		5
		4			1	7	3	8
8	3	7		1		5	9	2
4	6	2			9	1	7	3
		9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Note to step 26: The enumeration of details for the “only number” situations ends here.

Step 27:
only cell in
the row
for the
number 1

2			3		7	9		6
	7			8		2		5
		4			1	7	3	8
8	3	7		1		5	9	2
4	6	2			9	1	7	3
	1	9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 28:
last
number
for middle
left block

2			3		7	9		6
	7			8		2		5
		4			1	7	3	8
8	3	7		1		5	9	2
4	6	2			9	1	7	3
5	1	9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 29:
only cell in
the column
for the
number 3

2			3		7	9		6
3	7			8		2		5
		4			1	7	3	8
8	3	7		1		5	9	2
4	6	2			9	1	7	3
5	1	9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 30:
last
number
for first
column

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7		1		5	9	2
4	6	2			9	1	7	3
5	1	9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 31:
only cell
for the
number 4

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7		1	4	5	9	2
4	6	2			9	1	7	3
5	1	9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 32:
last
number in
the row

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2			9	1	7	3
5	1	9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 33:
only cell
for the
number 8

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8		9	1	7	3
5	1	9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 34:
last
number in
the row

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7			8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 35:
only cell in
the block
for the
number 3

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3		8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 36:
last
number
for the
row (&
block)

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6		9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 37:
only cell in
the row
for the
number 2

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9		3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 38:
last
number
for the
row &
block

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9			4	7	5	6	2	1

Step 39:
only cell in
the block
for the
number 3

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9		3	4	7	5	6	2	1

Step 40:
last
number in
the block
& row

2			3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 41:
only cell in
the column
for the
number 8
(also in
the block)

2		8	3		7	9		6
3	7			8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 42:
last
number in
the column

2		8	3		7	9		6
3	7	1		8		2		5
6		4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 43:
only cell in
the column
for the
number 9

2		8	3		7	9		6
3	7	1		8		2		5
6	9	4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 44:
last
number in
the column
and block

2	5	8	3		7	9		6
3	7	1		8		2		5
6	9	4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 45:
only cell in
the row
for the
number 1

2	5	8	3		7	9	1	6
3	7	1		8		2		5
6	9	4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 46:
last
number in
the row

2	5	8	3	4	7	9	1	6
3	7	1		8		2		5
6	9	4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 47:
last
number in
the block

2	5	8	3	4	7	9	1	6
3	7	1		8		2	4	5
6	9	4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 48:
last
number in
the column

2	5	8	3	4	7	9	1	6
3	7	1		8	6	2	4	5
6	9	4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 49:
last
number in
the row

2	5	8	3	4	7	9	1	6
3	7	1	9	8	6	2	4	5
6	9	4			1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 50:
last
number in
the column

2	5	8	3	4	7	9	1	6
3	7	1	9	8	6	2	4	5
6	9	4		2	1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Step 51:
last
number in
the row,
column,
and block

2	5	8	3	4	7	9	1	6
3	7	1	9	8	6	2	4	5
6	9	4	5	2	1	7	3	8
8	3	7	6	1	4	5	9	2
4	6	2	8	5	9	1	7	3
5	1	9	7	3	2	8	6	4
1	4	6	2	9	8	3	5	7
7	2	5	1	6	3	4	8	9
9	8	3	4	7	5	6	2	1

Now it's time for you to try it. The first 8 steps are only cell situations, so you won't have to write in the little numbers until after then.

	2			3			9		6	
		7			8				5	
			4			1		3		
	8				1				2	
	4	6				9	1			
			9	7				6		
			6		9				7	
		2				3		8		
	9			4		5	6			

Hint: 2