

DEVELOPING LOGICAL SKILLS WITH THE HELP OF SUDOKU

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

Basics

Sudoku is a logic-based, combinatorial number-placement puzzle.

The objective is to fill a 9×9 grid with digits so that each column, each row, and each of the nine 3×3 subgrids that compose the grid contains all of the digits from 1 to 9.

The puzzle setter provides a partially completed grid, which for a well-posed puzzle has a single solution.

History

French newspapers featured variations of the puzzles in the 19th century, and the puzzle has appeared since 1979 in puzzle books under the name Number Place. However, the modern Sudoku only started to become mainstream in 1986

by the Japanese puzzle company Nikoli, under the name Sudoku, meaning "single number". It first appeared in a US newspaper and then The Times (London) in

2004, from the efforts of Wayne Gould, who devised a computer program to rapidly produce distinct puzzles.

Pro and Contra on Sudoku for teaching

Positiv:

- ▶ You can play it everywhere and alone.
- ▶ Improve the logical skills.
- ▶ Very popular
- ▶ Less and easy rules.

Negativ:

- ▶ Not a social game.
- ▶ Only logical skills are improved but not the arithmetic.

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Rules

▶ Basic Rules for SUDOKU

- ▶ In each grid numbers 1-9 must exist only one time.
- ▶ In each line numbers 1-9 must exist only one time.
- ▶ In each grid numbers 1-9 must exist only one time.
- ▶ Time is in a normal game unlimited.
- ▶ In competitions time could be limited.

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Targets

- ▶ SUDOKU is a logical game.
- ▶ The students can not improve here arithmetic skills, but they improve their logical skills by:
 - ▶ Determine which number from 1-9 **MUST** be on a given position.
 - ▶ Determine which number from 1-9 **CANNOT** be on a given position.

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Materials

- ▶ You need a prefilled sheet (3x3 grids, each with 9 fields) to play SUDOKU.
- ▶ You must adapt the sheet to the knowledge of the students (smaller grids, more prefilled positions)
- ▶ The necessary materials (each player need his own sheet) you can get :
 - ▶ From internet.
 - ▶ In form of books .
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Materials

Easy 9x9 SUDOKU.

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

Materials

Very easy 4x4 SUDOKU.

	3	4	
4			2
1			3
	2	1	

Materials

And a very easy SUDOKU for men.

SUDOKU für Männer

1	2	3
4		6
7	8	9

Strategy for playing SUDOKU

- ▶ Find out 100% sure positions
 - ▶ Only one position is missing in a grid, row or column.
 - ▶ In a row and in an column 2 fields with the same number already set.
 - ▶ A row or column is filled with 3 numbers and your number is already in an other grid in your row or column.

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Strategy

Only one position is missing in a grid, row or column.

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

Strategy

In a row and in an column 2 fields with the same number already set.

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

Strategy

A row or column is filled with 3 numbers and your number is already in an other grid in your row or column.

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

Play the game

Start the game (easy 9x9 game)

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

Play the game

First decision

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

Play the game

First number completed

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

Play the game

First row completed

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

Play the game

Which must be the last number ???

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

Play the game

THE END

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