

KSEC Presents



ケンケン



判じ物



KenKen

Puzzles for the Classroom

(Suitable for Grades 4-12)



Kivalliq Science Educators' Community
Kivalliq School Operations

Preface

The document *Ken Ken Puzzles for the classroom* was compiled and developed by the Kivalliq Science Educators' Community and Kivalliq School Operations for use during Kivalliq Math Month and throughout the year.

KenKen is a new puzzle phenomenon that's sweeping the world! Educational, and fun, KenKen is a great way to exercise your brain and sharpen your mathematical tools at the same time!

Invented by Japanese math teacher Tetsuya Miyamoto in 2004, KenKen has joined Sudoku and crosswords as the most popular daily newspaper puzzles in the world.

Rules

Although the difficulty may vary from puzzle to puzzle, the rules for playing KenKen are fairly simple.

1. The size of the puzzle determines the numbers that may be used. Ex:
 - a 3x3 puzzle uses the numbers 1-3;
 - a 4x4 puzzle uses the numbers 1-4;
 - a 5x5 puzzle uses the numbers 1-5, etc.
2. The same number may not be repeated in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine (in any order) to produce the target number in the top corner of the cage using the mathematical operation indicated (+ - x ÷).
4. Cages with just one box should be filled in with the target number in the top corner. These are "freebies" and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

KenKen in the Classroom

The key math skills utilized in solving a KenKen puzzle are addition, subtraction, multiplication, division, and logic. By grade four most students have mastered the four mathematical operations and have the innate logic necessary to solve a simple KenKen, but have not developed the perseverance to complete a puzzle. Teachers who introduce simple puzzles via the overhead projector or blackboard and work through student solutions together with the class have been successful in helping students to develop strategies and perseverance to enjoy KenKen puzzles.

An electronic version of this document can be found on the KSO Learning Community website: <https://sitesgoogle.com/site/ksolearningcommunity/updates>

Jim Kreuger
Baker Lake, October/09

KenKen and Other Puzzle Resources on the Internet

<http://www.math.rutgers.edu/~baxter/KenKen/KenKen.html>

One Hundred And Twenty KenKen Puzzles By Doron Zeilberger's 2009 Experimental Math Class. Many of the puzzles in this document were found on this site.

www.mathdoku.com

At MathDoku you can play this highly addicting logic and math puzzle game. It is available in both online and printable formats for free.

1sudokuspot.blogspot.com/2009/03/kenken-sudoku.html

www.kenken.com

The official KenKen site.

www.ouraytoys.com

Tucker-Jones Tavern Puzzles are a true challenge! Choose from many.

www.ThirdAge.com/games

Tons of Cool Mind Games. Unlimited Play For Free.

www.lumosity.com

Improve at Logic Puzzles with Online Brain Training Games.

www.Pronto.com

Find Suduko Puzzles at Great Prices.

www.langevin.com

Get Ralph's Ultimate Collection of Brainteasers, Puzzles & Trivia

www.nationalgeographic.com

Play this free jigsaw puzzle to see Mt. Everest live in true color!

www.all4smartkids.com

Find it here. Great Resources About Kids Printable Puzzles

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3x3 KenKen Puzzle 1**Rules**

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

18x		1
	1	12x
1		

3x3 KenKen Puzzle 2

Rules

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

1	7+	2
7+		
		1

3x3 KenKen Puzzle 3**Rules**

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6+		
5+		12x

3x3 KenKen Puzzle 4

Rules

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6x		5+
1-		
	4+	

3x3 KenKen Puzzle 5**Rules**

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6x		2x
2-		
	5+	

3x3 KenKen Puzzle 6

Rules

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

4x	3x	
		6x
3x		

3x3 KenKen Puzzle 7**Rules**

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

2÷	8+	1
6x		

3x3 KenKen Puzzle 8

Rules

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6+	9x	
	4x	

3x3 KenKen Puzzle 9**Rules**

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6+		4+
6x		
	1-	

3x3 KenKen Puzzle 10

Rules

1. Fill in each box in the puzzle with a number from 1 to 3.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

1-	5+	
	6x	4+

4x4 KenKen Puzzle 1

Rules

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6x			4
3x	7+		
	1-		12x
5+			

4x4 KenKen Puzzle 2

Rules

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

3	8x		
24x		12x	
	2x		9+

4x4 KenKen Puzzle 3**Rules**

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6+		32x	1
9+			
		3x	
1	24x		

4x4 KenKen Puzzle 4

Rules

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

7+		1-	
	3	4+	12x
12x			
	6+		

4x4 KenKen Puzzle 5

Rules

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

7+		9+	
	12x		
1-	3-		6x

4x4 KenKen Puzzle 6

Rules

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

4x		36x	
	12x		1
7+		2	8x

4x4 KenKen Puzzle 7**Rules**

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

4	6+		
8+	3	5+	4
2x		1-	

4x4 KenKen Puzzle 8

Rules

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

8+	7+		
		9+	
1-	6x		7+

4x4 KenKen Puzzle 9**Rules**

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6x		5+	
12x	6+		
	7+	6+	
		4	

4x4 KenKen Puzzle 10

Rules

1. Fill in each box in the puzzle with a number from 1 to 4.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6x	1-	7+	2
	8x	8+	3

5x5 KenKen Puzzle 1

Rules

1. Fill in each box in the puzzle with a number from 1 to 5.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

1-	100x		6+	
		10+		
30x		48x		
1-		12+		

5x5 KenKen Puzzle 2

Rules

1. Fill in each box in the puzzle with a number from 1 to 5.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

12+			12x	
	24x	3	12+	
				11+
	300x			
2				

5x5 KenKen Puzzle 3

Rules

1. Fill in each box in the puzzle with a number from 1 to 5.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

24x		30x		
	4x		20x	
11+				
	160x			8+
6+				

5x5 KenKen Puzzle 4

Rules

1. Fill in each box in the puzzle with a number from 1 to 5.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

10x			36x	
12+		1-		
			16+	
12x	14+		1	

5x5 KenKen Puzzle 5

Rules

1. Fill in each box in the puzzle with a number from 1 to 5.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

13+	4	30x		
		1-	48x	
12x				
	11+	12+		

6x6 KenKen Puzzle 1

Rules

1. Fill in each box in the puzzle with a number from 1 to 6.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

30x		11+	11+		
			13+		60x
12+				14+	
6x	80x	7+		108x	

6x6 KenKen Puzzle 2

Rules

1. Fill in each box in the puzzle with a number from 1 to 6.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

72x		48x		75x	
		24x		120x	
1-					
		180x		2x	144x
11+					
		6			

6x6 KenKen Puzzle 3

Rules

1. Fill in each box in the puzzle with a number from 1 to 6.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

6+		6+	12+		
18x			17+	10+	
		90x			
15+	2-				36x
			3÷		
	11+				

6x6 KenKen Puzzle 4

Rules

1. Fill in each box in the puzzle with a number from 1 to 6.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

2x		8+	216x		
21+				7+	
			17+		
8x				10x	
180x		48x			12+

6x6 KenKen Puzzle 5

Rules

1. Fill in each box in the puzzle with a number from 1 to 6.
2. Do not repeat a number in any row or column.
3. The numbers in each cage (a heavily outlined square or set of squares) must combine in any order, using the mathematical operation indicated, to produce the target number in the top corner.
4. Cages with just one box should be filled in with the target number in the top corner. These are “freebies” and are the best place to begin your solution.
5. A number may be repeated within a cage as long as it is not in the same row or column.

1-		7+		48x	
40x				180x	
216x					
	180x		40x		13+
10+					

3x3 KenKen Solutions

Puzzle 1	^{18x} 2	3	¹ 1
	3	¹ 1	^{12x} 2
	¹ 1	2	3

Puzzle 2	¹ 1	^{7x} 3	² 2
	^{7x} 2	1	3
	3	2	¹ 1

Puzzle 3	^{6x} 2	3	1
	^{5x} 3	1	^{12x} 2
	1	2	3

Puzzle 4	^{6x} 3	1	^{5x} 2
	^{1x} 1	2	3
	2	^{4x} 3	1

Puzzle 5	^{6x} 2	3	^{2x} 1
	^{2x} 3	1	2
	1	^{5x} 2	3

Puzzle 6	^{4x} 2	^{3x} 3	1
	1	2	^{6x} 3
	^{3x} 3	1	2

Puzzle 7	^{2x} 2	^{8x} 3	¹ 1
	1	2	3
	^{6x} 3	1	2

Puzzle 8	^{6x} 2	^{9x} 3	1
	1	^{4x} 2	3
	3	1	2

Puzzle 9	^{6x} 1	2	^{4x} 3
	^{6x} 2	3	1
	3	^{1x} 1	2

Puzzle 10	^{1x} 1	^{5x} 3	2
	2	^{6x} 1	^{4x} 3
	3	2	1

4x4 KenKen Solutions

Puzzle 1	^{6x} 2	3	1	⁴ 4
	^{3x} 3	⁷⁺ 2	4	1
	1	¹⁺ 4	3	^{12x} 2
	⁵⁺ 4	1	2	3
Puzzle 3	⁶⁺ 2	3	^{32x} 4	¹ 1
	⁹⁺ 3	1	2	4
	4	2	^{3x} 1	3
	¹ 1	^{24x} 4	3	2
Puzzle 5	⁷⁺ 1	2	⁹⁺ 3	4
	4	^{12x} 3	1	2
	¹⁺ 2	³⁺ 1	4	^{6x} 3
	3	4	2	1
Puzzle 7	⁴ 4	⁶⁺ 2	3	1
	⁸⁺ 1	³ 3	⁶⁺ 2	⁴ 4
	3	4	1	2
	^{2x} 2	1	¹⁺ 4	3
Puzzle 9	^{6x} 2	3	⁵⁺ 1	4
	^{12x} 4	⁶⁺ 1	3	2
	3	⁷⁺ 4	⁶⁺ 2	1
	1	2	⁴ 4	3

Puzzle 2	³ 3	^{8x} 4	2	1
	²⁴⁺ 2	3	^{12x} 1	4
	4	^{2x} 1	3	⁹⁺ 2
	1	2	4	3
Puzzle 4	⁷⁺ 1	4	¹⁺ 3	2
	2	³ 3	⁴⁺ 1	^{12x} 4
	^{12x} 4	1	2	3
	3	⁶⁺ 2	4	1
Puzzle 6	^{4x} 1	2	^{36x} 4	3
	2	^{12x} 4	3	¹ 1
	⁷⁺ 3	1	² 2	^{8x} 4
	4	3	1	2
Puzzle 8	⁸⁺ 3	⁷⁺ 4	2	1
	4	1	⁹⁺ 3	2
	¹⁺ 1	^{6x} 2	4	⁷⁺ 3
	2	3	1	4
Puzzle 10	^{6x} 3	¹⁺ 4	⁷⁺ 1	² 2
	1	3	2	4
	2	^{8x} 1	⁶⁺ 4	³ 3
	4	2	3	1

5x5 KenKen Solutions

6x6 KenKen Solutions

Puzzle 1	1 ⁻	100 ^x	5 ⁺	2	1	
	3	4	5	2	1	
	4	5	2	1	3	
	30 ^x	1	3	4	5	
	5	2	1	3	4	
1 ⁻	2	1	12 ⁺	3	4	5
Puzzle 2	12 ⁺	5	1	2	3	4
	4	2	3	5	1	
	3	4	1	2	5	
	1	3	5	4	2	
	2	5	4	1	3	
Puzzle 3	24 ^x	4	2	5	3	1
	4 ^x	3	4	1	5	2
	11 ⁺	5	3	2	1	4
	160 ^x	1	5	4	2	3
	6 ⁺	2	1	3	4	5
Puzzle 4	10 ^x	2	5	1	4	3
	12 ⁺	5	4	2	3	1
	1	2	3	5	4	
	12 ^x	4	3	5	1	2
	3	1	4	2	5	
Puzzle 5	13 ⁺	4	30 ^x	1	2	3
	2	1	3	4	5	
	12 ^x	1	5	2	3	4
	11 ⁺	3	2	4	5	1
	4	3	5	1	2	

Puzzle 1	30 ^x	5	6	1	3	4	2
	4	1	5	6	2	3	
	12 ⁺	6	2	3	4	1	5
	1	3	6	2	5	4	
	9 ^x	3	4	2	5	6	1
	2	5	4	1	3	6	
Puzzle 2	72 ^x	2	3	4	6	5	1
	3	4	1	2	6	5	
	1 ⁻	5	6	2	1	4	3
	6	2	3	5	1	4	
	11 ⁺	4	1	5	3	2	6
	1	5	6	4	3	2	
Puzzle 3	6 ⁺	1	5	3	2	6	4
	18 ^x	3	1	2	6	4	5
	2	3	6	4	5	1	
	15 ⁺	5	4	1	3	2	6
	4	6	5	1	3	2	
	6	2	4	5	1	3	
Puzzle 4	2 ^x	2	1	5	4	6	3
	6	5	1	3	2	4	
	4	6	2	5	3	1	
	8 ^x	1	4	3	6	5	2
	100 ^x	3	2	6	1	4	5
	5	3	4	2	1	6	
Puzzle 5	1 ⁻	5	6	1	2	4	3
	40 ^x	2	5	3	1	6	4
	6	4	2	5	3	1	
	3	1	6	4	2	5	
	4	3	5	6	1	2	
	10 ⁺	1	2	4	3	5	6