# Shakashaka

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*Shakashaka is a logic puzzle in which the solver must colour black triangles within a square grid, in order to create white squares and rectangles according to certain constraints. This paper gives a brief account of the history and design of this delightfully geometrical puzzle.*

## 1 Introduction

SHAKASHAKA is a pure deduction puzzle, invented for Nikoli by Japanese designer Guten, which first appeared in the June 2008 issue of *Puzzle Tsushin Nikoli 123*.

Shakashaka initially caused some disagreement among our editing section as to its longevity when first published, but it has since been enthusiastically embraced by our readers, especially young female readers, who refer to the puzzle as 'Kawaii' after a favourite mosaic-style game, which translates as 'cute' in English. It is now so popular that it has become a regular feature of *Puzzle Communication Nikoli*, from volume 127 onwards, a year after it first appeared.

## 2 Rules

Shakashaka is played on a grid of squares, with some cells initially coloured black, some of which are marked with *hint* values. Figure 1 shows a typical challenge.

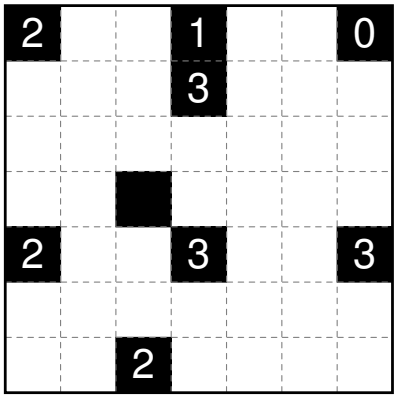


**Figure 1.** A typical Shakashaka challenge.

There are four ways to fill a coloured a triangle between opposite corners of a cell, as shown in Figure 2.

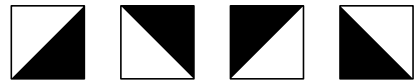

**Figure 2.** The four triangle rotations.

The aim in Shakashaka is to draw such triangles in some of the empty cells, so that:

1. hint cells are immediately adjacent to the number of triangles indicated, and
2. all remaining white regions form squares or rectangles.

Figure 3 shows the solution for this challenge.

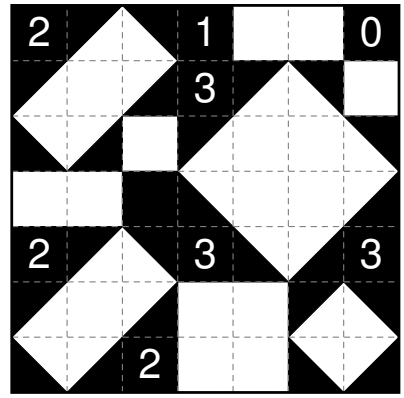


**Figure 3.** Unique solution for this challenge.

Note that the final squares and rectangles may be angled diagonally, and that some grid cells may not need to have a triangle drawn in them to solve the challenge. Hint cells without a number can have any number of adjacent triangles.

## 3 Worked Example

A basic tactic for Shakashaka is: *do not create acute angles*. For example, Figure 4 shows the 2 hint cell in the top left corner of the above challenge (upper), and the four possible triangle rotations