

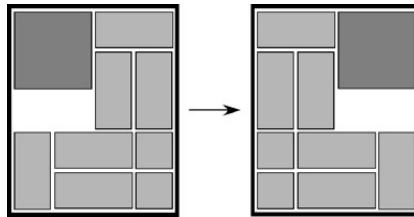
Quzzle And Quzzle Killer



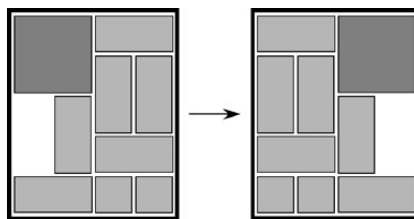
Quzzle designed by Jim Lewis circa 2000.

(cardboard box containing plastic tray and 9 plastic pieces, 5.9 x 4.9 x 1/2 inches)

Uses 1x1, 1x2, 2x1, and 2x2 pieces on a 4x5 board like *Dad's Puzzler*. Below, from the start position shown on the left, slide pieces (without picking them up) to form the end position (a mirror copy of the start position) shown on the right:



It turns out that if the goal is stated to simply be, from the start position, move the 2x2 to the upper right corner (so it doesn't matter what happens to the other pieces), then a minimal length solution of 93 straight-line moves (equivalent to 84 rectilinear moves) makes a mirror image, and so this simpler problem has the same basic complexity. When it was introduced, Quzzle was known for requiring a large number of moves for puzzle of its type. There are puzzles in Dad's Puzzle family that require many more moves (e.g., *Century Puzzles*), and even with exactly the same set of pieces as Quzzle, there are puzzles that require more moves. For example, *Quzzle Killer* of B. Henderson and Gil Dogon (discussed on *Pegg's Page* and you can play on *Baxter's Page*) requires more moves just to get the 2x2 piece to the upper right, and 6 additional moves to make the mirror image:



Further reading:

Quirkle Page, from: <http://www.quirkle.com>

Quzzle Page, from: <http://www.quirkle.com/puzzle/index.htm>

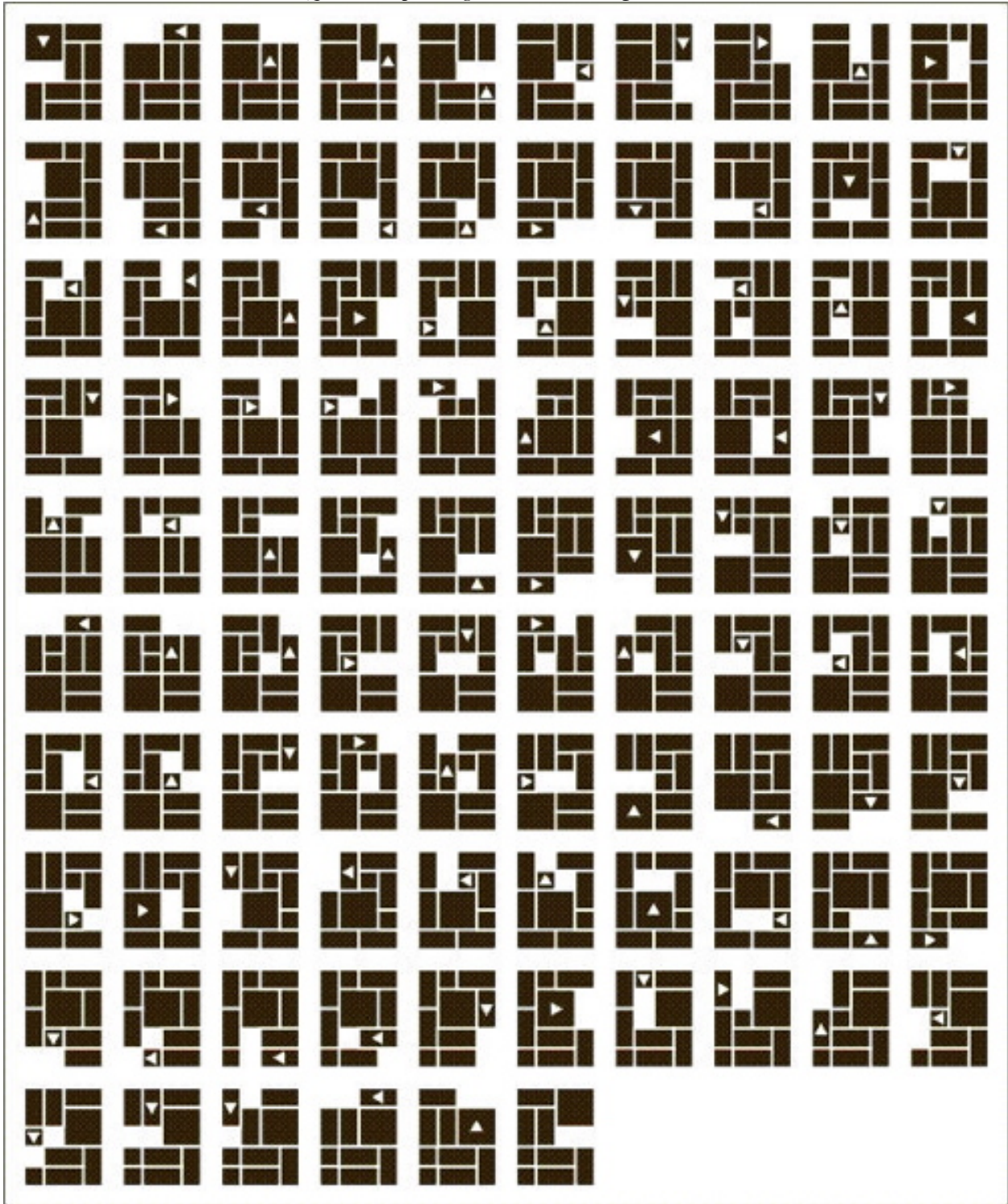
Quzzle Tips Page, from: <http://www.quirkle.com/puzzle/tips.htm>

Pegg's Page, from: http://www.maa.org/editorial/mathgames/mathgames_12_13_04.html

Baxter's Page, from: <http://www.puzzleworld.org/SlidingBlockPuzzles/qkiller.htm>

Quzzle Solution Provided By The Inventor

Here is the solution from the *Quzzle Tips Page* uses 95 straight-line moves.



one move = slide one piece any number of units in one direction

Another Quzzle Solution

Here is a solution of 93 straight-line moves; it corresponds to 84 rectilinear moves (by combining steps 5/6, 14/15, 20/21, 25/26, 34/35, 37/38, 73/74, 79/80, 88/89).

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

one move = slide one piece any number of units in one direction

A Quzzle Killer Solution

Here is a (minimal) solution of 99 straight-line moves that solve basic Quzzle Killer followed by an additional 6 moves (105 total) to solve the full mirrored version; it can be converted to 90 rectilinear moves (also known to be minimal) by compining steps 11/12, 20/21, 26/27, 31/32, 40/41, 43/44, 79/80, 85/86, 94/95 for basic Quzzle Killer followed by 6 more moves:

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

one move = slide one piece any number of units in one direction