

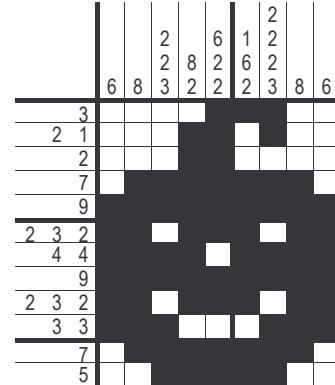
Pixel Paint by Number Logic Puzzles: Autumn
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How to Solve Pixel Paint by Number Logic Puzzles

The easiest way to understand how to solve the puzzles is to look at a completed puzzle.

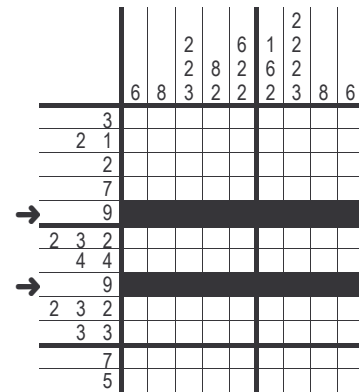
The image to the right shows a completed puzzle. As you can see by looking at it, the number clues tell how many filled squares are in each row and column. Each number represents a group of filled squares in that particular row or column. There is **always** at least 1 empty square separating the groups of filled squares.



Step by Step Solving

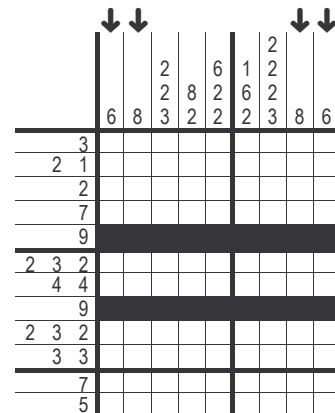
When solving a puzzle, I first look for any rows or columns that have 0 filled squares or have every square filled.

The example to the right shows a puzzle grid that is 9 squares wide by 12 squares high. The ideal place to begin is with the rows marked with arrows. The number clue for each of these rows is **9**; meaning that each of these rows will contain a block of **9** filled squares. Since the puzzle is **9** squares wide, then every square must be filled, as shown.



Now that a few squares have been filled in, we have more information to work with.

Each of the columns I marked with arrows has only 1 number clue. This means that each column has only 1 group of filled squares. Since we have two filled squares that are separated by empty squares, we know that the squares in between must be filled to create a single group.



Looking at the marked columns, we know that each column contains a group 6 filled squares. We know the location of 4 of those filled squares.

The other 2 filled squares in the column can only be the 2 squares directly above **OR** the 2 squares directly below the group of 4. The other squares in the column must be empty! I have marked those empty squares with a dot.

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

Knowing that there are 2 squares that must remain empty (marked with dots), we can solve the marked row. The marked row contains a group of 7 filled squares, which includes every remaining square in this row.

Puzzles are solved by working through the clues, alternating between rows and columns to figure out which squares are filled and which must remain empty. As each puzzle is solved, a picture will appear in the grid.

Let's continue solving this puzzle.

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

The row I have marked here is not as simple to solve. The row contains a group of 5 filled squares, but there are 7 available squares in the row.

To help in solving this row, we will use the **overlapping** method.

If you begin at the first possible square on the left and count out 5 squares, you will find that if these squares were filled, they would span the squares I marked with "x". (fig.a)

If you begin at the first possible square on the right and count out 5 squares, you will find that if these squares were filled, they would span the squares I marked with "o". (fig.b)

So, whether you begin the group of 5 at the left or right, there is an overlap of 3 squares. No matter where the group of 5 is located, these 3 squares must be filled. (fig. c)

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

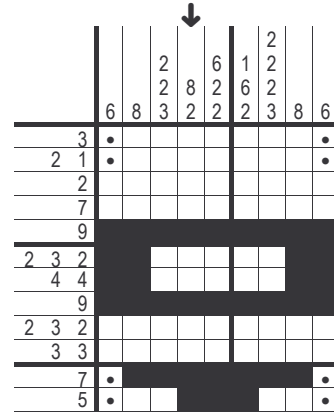
fig. a 5 | • | x | x | x | x | x | •

fig. b 5 | • | | | o | o | o | o | o | •

fig. c 5 | • | | | | | | •

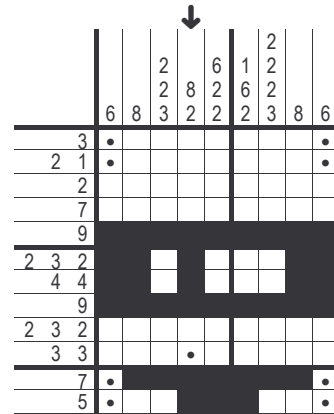
Take a look at the marked column in this grid. We know that this column will contain a group of 8 and a group of 2 filled squares, in order.

At the bottom of the column, you can see that the group of 2 filled squares has already been determined. We know that groups are separated by at least 1 empty square, so we know that the square directly above the 2 filled squares must be empty! I will mark the empty square with a dot.



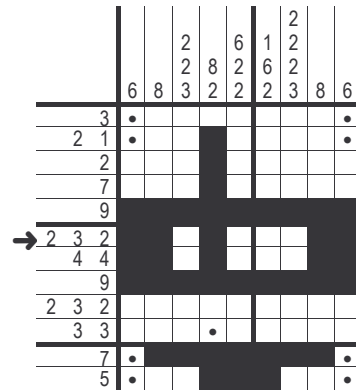
We also know that we can fill in the 2 empty squares between the filled squares to create a single group, since we only have one group of 8 filled squares remaining in this column.

Using the **overlapping** method on this column helps us to determine the location of more of the filled squares.



We have enough information to solve the marked row in this grid. We know that the first group of 2 has been determined, so we can mark the empty square that must be the next square to the right.

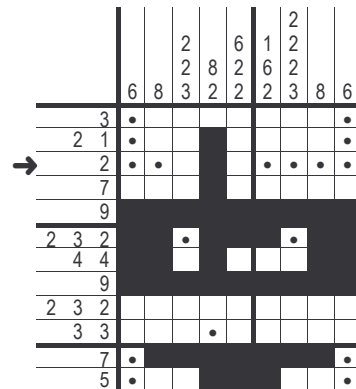
Also note that the final group of 2 filled squares has also been determined. As we mark the empty square directly to the left of the group, we see that there remain just enough squares to complete the group of 3 filled squares in the center.



In this marked row, we know the location of 1 of the filled squares in the 2 square group. The other square can only be directly to the left **OR** directly to the right of the known filled square.

The remaining squares in this row must be empty. I have marked them each with a dot.

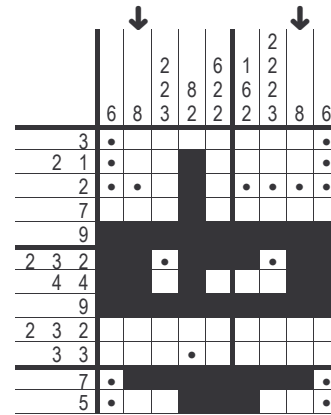
We have discovered quite a bit of information to use in solving this puzzle.



We can make some progress with the two marked columns in this grid.

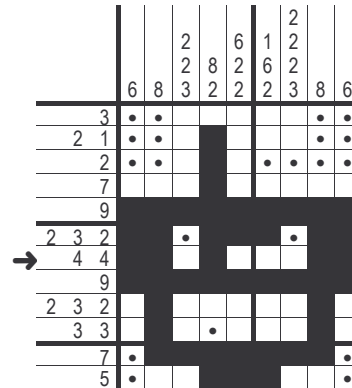
There is one group of 8 filled squares in each column. There are 2 empty squares located between filled squares. Since there is only one group of 8 filled squares in this column, these 2 squares must be filled!

At the top of each column, there are only 2 available squares. They cannot be part of the 8 square group, so they must be empty!



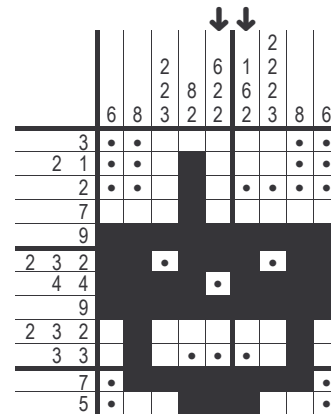
The row in this grid should be simple. We have determined that the first group of 4 filled squares begins in the very first box at the left. We can fill the remaining square to create the 4-block group and also mark the empty square to the right of the group.

We also see that there are only 4 remaining squares (2 of which are already filled), which must create our other 4-block group. This completes the marked row. (see next diagram)



In the two marked columns, we see that the final 2-block group in each column has already been determined. We can mark the empty squares directly above each group.

Once the empty squares are marked, the remaining groups in the first marked column are apparent. We see that all of the remaining squares must be filled to create the other groups.



In the first marked row, the location of the 2-block group is known. One square on each side must be marked as empty. Once this is done, the location of the single filled square is known.

In the second row, the 2-block group has been determined. The remaining square must be empty.

The third marked row has enough marked squares to determine that filling in the remaining squares will create the two 3-block groups and solve the row.

