

## Twelfth day of Christmas walkthrough

On the twelfth day of Christmas my true love sent to me:

12 Drummers Drumming, 11 Pipers Piping, 10 Lords a Leaping, 9 Ladies Dancing,  
8 Maids a Milking, 7 Swans a Swimming, 6 Geese a Laying, 5 Golden Rings,  
4 Calling Birds, 3 French Hens, 2 Turtle Doves and a Partridge in a Pear Tree

We are told that each square holds at most 4 items so first think about the minimum number of squares each type will use:

<b>Item</b>	1	2	3	4	5	6	7	8	9	10	11	12
<b>Minimum squares</b>	1	1	1	1	2	2	2	2	3	3	3	3

If each type uses the minimum number of squares 24 squares will be used. So 1 and only 1 type uses 1 more square than it needs.

### **C2 is 1 Hen**

We are told that C3 also contains Hens, so Hen must be the type that is split. It only has one extra square so this must contain remaining hens (and the other types will use the minimum number of squares).

### **C3 is 2 Hens**

We are told that B3 contains Doves, all the Doves must be in B3 so

### **B3 is 2 Doves**

We are told that B4 contains Maids. There are 8 Maids, so they must split 4,4 so

### **B4 is 4 Maids**

		4 Drummers		
	3 Geese	1 Hen		
	2 Doves	2 Hens		
	4 Maids			
	3 Ladies	3 Ladies		

We are told that the Drummers are horizontal and not adjacent to Maids. The Drummers will be 3 adjacent squares in a row and must not be adjacent to B3. The only place this can fit is in the first row. Wherever they are in the row they must include A3 and there are 12 Drummers so they must split 4, 4, 4 so

### **A3 is 4 Drummers**

We are told all columns have exactly two 3s, this means that there must be ten 3 squares in the solution. If we look at the split of numbers across the squares with the maximum number of 3s for each we get the table below (with numbers already used in grey):

<b>Item</b>	1	2	3	4	5	6	7	8	9	10	11	12
<b>Minimum squares</b>	1	1	1 (2)	1	2	2	2	2	3	3	3	3
<b>Split for Max 3s</b>	1	2	1, 2	4	3, 2	3, 3	4, 3	4, 4	3, 3, 3	4, 3, 3	4, 4, 3	4, 4, 4

This gives ten 3s, so we know all splits must be as shown. In addition we are told that there are Geese in B2, we now know Geese split 3, 3 so

### **B2 is 3 Geese**

We are told there are some Ladies in the bottom row. The Ladies split 3, 3, 3 so must be horizontal, wherever they are in the bottom row they must include E3 so

### **E3 is 3 Ladies**

We are told that no Lords are adjacent to Maids. This means that the only place the Lords could fit is in the fourth or fifth column. The Lords split 4, 3, 3 so there cannot be a Lady in the same column so

### **E2 is 3 Ladies**

		4 Drummers		
3 Geese	3 Geese	1 Hen		
4 Birds	2 Doves	2 Hens		
4 Maids	4 Maids	3 Swans	4 Swans	
	3 Ladies	3 Ladies		

Now the 4 Maids cannot go in D3 because column 3 needs another 3 so

### **D1 is 4 Maids**

Also the 3 Geese cannot go in A2 because column 2 would then have three 3s so

### **B1 is 3 Geese**

We are told that every corner is a different number (i.e. 1, 2, 3, 4). There are only two types left that take only one square, 1 and 4, but 1 will be in a corner so

### **C1 is 4 Birds**

We are told that no Piper is adjacent to a Maid. The remaining items are:

<b>Item</b>	1	2	3	4	5	6	7	8	9	10	11	12
<b>Minimum squares</b>	1	1	1 (2)	1	2	2	2	2	3	3	3	3
<b>Split for Max 3s</b>	1	2	1, 2	4	3, 2	3, 3	4, 3	4, 4	3, 3, 3	4, 3, 3	4, 4, 3	4, 4, 4

D3 has to be a 3 and the only possibility is the Swans (since the Rings involve the only 2, which must be in a corner) so

D3 is 3 Swans and D4 is 4 Swans

4 Drummers	4 Drummers	4 Drummers		1 Partridge
3 Geese	3 Geese	1 Hen		
4 Birds	2 Doves	2 Hens		
4 Maids	4 Maids	3 Swans	4 Swans	
3 Ladies	3 Ladies	3 Ladies	3 Rings	2 Rings

The Pipers and the Lords must be vertical, one in column 4 and one in column 5. The one in column 4 will block the Drummers at A4 so

**A2 is 4 Drummers and so is A1**

E1 must be a 3, and the only way this can happen is

**E1 is 3 Ladies**

Now 1 Partridge and 2 Rings need to be in corners so

**E4 is 3 Rings and E5 is 2 Rings**

And

**A5 is 1 Partridge**

Finally the Pipers must be in the 4<sup>th</sup> column, and the Dancers in the fifth and following the instruction in A5 gives:

4 Drummers	4 Drummers	4 Drummers	3 Pipers	1 Partridge
3 Geese	3 Geese	1 Hen	4 Pipers	3 Lords
4 Birds	2 Doves	2 Hens	4 Pipers	4 Lords
4 Maids	4 Maids	3 Swans	4 Swans	3 Lords
3 Ladies	3 Ladies	3 Ladies	3 Rings	2 Rings

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