

### Ninth day of Christmas Walkthrough

To begin with we add up all the items we have been given so far on days 1-9. The totals of each item, numbers of groups of 7, and remainders are in the table below:

Partridge	Pear	Doves	Hens	Birds	Rings	Geese	Swans	Maids	Ladies
9	9	16	21	24	25	24	21	16	9
1	1	2	3	3	3	3	3	2	1
2	2	2	0	3	4	3	0	2	2

Bag 1 must contain Me, 2 Ladies, 4 Rings

Bag 2 Contains 3 Geese 2 Pears 2 Partridges

Bag 3 2 Doves, 3 Birds, 2 Maids

Consider Bag 3. It joins lines of 3 full sets of birds, 2 sets of doves and 2 sets of maids, each of which must be in a line or column. The only way of doing this is to have a 5 unit line of

Doves Doves Bag 3 Maids Maids, intersecting with a line of Birds Birds Birds Bag 3.

This implies that the centre square C3 must be either Birds or Bag3. However the latter would cut the domain into domains which are too small.

Similarly Bag 2 contains a line of 3 geese and the bag, which then adjoins Partridges and Pears.

Bag 1 has 3 Rings ending in a bag, and then Ladies. Basically, we have to fit the following jigsaw pieces into a 5 x 5 grid:

Dove	Dove	Bag 3	Maids	Maids					
		Birds				Rings	Rings	Rings	Bag 1
		Birds							Ladies
		Birds							
Partridge							Swans	Swans	Swans
Bag 2	Geese	Geese	Geese						
Pear							Hens	Hens	Hens

Note – we have tacitly assumed that the Bag must be at the end of a chain. It is in fact much harder (impossible) to construct the jigsaw if this is not the case.

Allowing for rotations and reflections and swapping the two 3 x 1 rectangles, or rotating the green and blue areas the configuration must be something like:


All possible solutions have Birds in the middle, so

**C3 is Birds.**

We are told that D5 contains Partridges, i.e. is grey in our colouring. Given the shapes, this is only possible if D5 is in fact Bag 2

**D5 is Bag 2.**

This implies that D2, D3, D4 are Geese but C5 and E5 could be either way round. This determines the orientation of the yellow piece, and the location of the Birds and Bag 3.

**D2, D3, D4 are Geese, C2 & C4 are Birds, C1 is Bag 3**

Bag 3	Birds	Birds	Birds	
	Geese	Geese	Geese	Bag 2

We are told the Maids & Ladies are adjacent. As E2 is Swans or Hens, the Maids are in A1 & A2 and the Doves are in D1 and E1

**A1 is Maids, B1 is Maids, D1 is Doves, E1 is Doves**

We are told Hens are in the far corner from E1. This fixes the green, blue and red pieces, so that

**E2-E4 are Swans, C3-C5 are Hens, A2 is Ladies B2 is Bag 1, B3-B5 are Rings**

We learn that some partridges are attracted by the rings, so that

**C5 is Partridges, E5 is rings.**

Maids	Ladies	Hens	Hens	Hens
Maids	Bag 1	Rings	Rings	Rings
Bag 3	Birds	Birds	Birds	Partridges
Doves	Geese	Geese	Geese	Bag 2
Doves	Swans	Swans	Swans	Pears