



Mathematics Institute of the Triangle

Twelve Days of Christmas: Grades 1 and up

Mr. Barman, Christmas 2025

Materials needed: just paper and pencil; for first graders,
30-40 stones, raisins, or other objects (beware choking hazards)

Do you know the song *The Twelve Days of Christmas*?

Many of you know this “cumulative” (add it up) song that comes from England in the late 1700s. One variation of the song goes like this:



*On the first day of Christmas my true love gave to me
A partridge in a pear tree.*

*On the second day of Christmas my true love gave to me
Two turtle doves
And a partridge in a pear tree.*

*On the third day of Christmas my true love gave to me
Three French hens,
Two turtle doves,
And a partridge in a pear tree.*

*On the fourth day of Christmas my true love gave to me
Four calling birds,
Three French hens,
Two turtle doves,
And a partridge in a pear tree.*



The song continues on in this way. On the fifth day five golden rings are added; on subsequent days we have six geese a-laying, seven swans a-swimming, eight maids a-milking, nine ladies dancing, ten lords a-leaping, eleven pipers piping, and finally on the twelfth day, twelve drummers drumming.



Your challenge: how many gifts are given? What patterns do you see?

Let's look at the first three days.

1. On day one, 1 gift is given – a partridge in a pear tree.

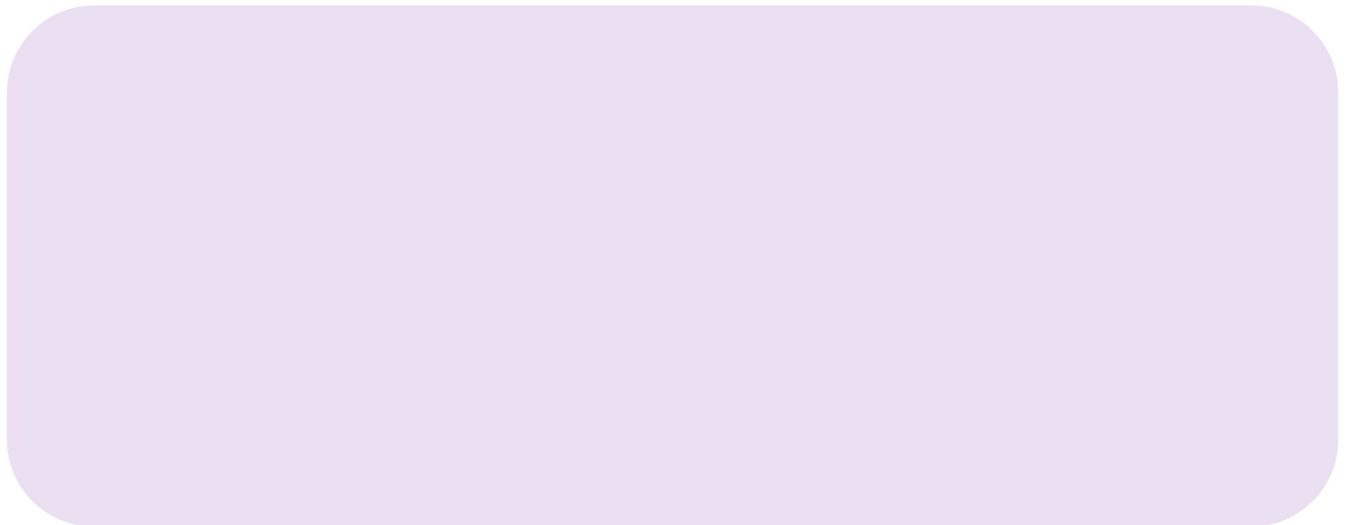
2. Imagine waking up on the second day. You have your one gift, a partridge tweeting away in a pear tree. But more gifts are coming! You get two turtle doves and another partridge in a pear tree. So you have 1 old gift plus $2+1 = 3$ new gifts; you have four gifts in total.
3. You are enjoying those four gifts! But more is to come. You now get three French hens, two turtle doves, and a partridge in a pear tree; $3+2+1 = 6$ new gifts. You now have $4+6 = 10$ gifts!

Keep going and look for patterns.

First and second graders: can you easily make patterns showing how many gifts are given?

Try finding the number of gifts given in just 5 days; if you want you can go all the way to 12. Do you have stones, raisins, dimes, pieces of cereal, or other objects that you can use? Let's make some shapes.

Let's consider day 3. Can you make a shape with 3 of an object plus 2 more of that object, plus 1 more of that object to represent the three French hens, two turtle doves, and partridge? Play with your objects and jot some ideas down here.



Did you come up with some nice arrangements of your objects? On the next page I have put stones in three rows. Turn the page when you are ready to see what I did.





I put three stones in one row, then two stones in a second row, then one stone by itself in a last row. It forms a nice triangle!

The triangle shows us $3 + 2 + 1$; that is 6. I'm used to counting from small to larger numbers so will flip the triangle to make it show us $1 + 2 + 3$.



Let's see how many gifts we get with our stones.

Day 1: We have one gift.



Day 2: We have one old gift plus $(1+2)$ new gifts.



Day 3: We have $1 + (1+2) + (1+2+3)$ or $1 + 3 + 6 = 4 + 6 = 10$ gifts.



Keep going as far as you wish! How many gifts are given in 4 days? 5 days? Can you predict the answer without using your objects? How about all 12 days?

Second graders: can you go all the way to all 12 days?

Try finding the number of gifts given in just 5 days; if you want you can go all the way to 12. Do you see any patterns?

It's helpful making a table. Can you complete this table?



Day	Gifts you start with	Gifts you get	Total gifts
1	0	1	1
2	1	$1+2 = 3$	$1+3 = 4$
3	4	$1+2+3 = 6$	$4+6 = 10$
4			
5			
6			
7			
8			
9			
10			
11			
12			

