

Applied Math Twelve Days of Christmas Costs



Goal: Use spreadsheet to organize and calculate recursive costs

Question: How much money did “my true love” spend on how many gifts?

Skills

- Organize data in a spreadsheet
- Use TREND formula to predict current cost of supplies based on historical data
- Use reasoning to determine recurring features
- Use SUM, PRODUCT functions to calculate subtotals and totals

Instructions

The holidays are upon us and we are inundated with Christmas music. One traditional song, *The Twelve Days of Christmas*, speaks of one celebrant of Christmas bestowing his true love with an onslaught of gifts and entertainment. Your task is to determine how much money is spent on the true love.

1. Enter the data from Info Sheet 2 into a spreadsheet. Use the TREND formula to predict prices for this year.
2. Create another table that collects data about each gift. This table needs to use TREND (from data from first table), PRODUCT (to calculate how much each gift will cost) and SUM (to calculate the daily and summative costs). Remember that most gifts are given on multiple days.
3. For advanced, decorate your spreadsheet with appropriate images of the gifts given.
4. Write a summary of the data and three observations of the data. The summary might look like this: *In the end, the lover gave _____ gifts which cost _____. The most expensive gift cost _____ per one and the least expensive gift cost _____ per one.*

Rubric

A: Exceptional	Proficient Plus: Excellent use of shading. Pictures of actual samples gifts given. Observations are insightful
B: Proficient	Data is accurate. Organization is clean. Spreadsheet auto calculates. Observations are sufficient. Delete unused rows/columns.
C: Basic	Some missing data. Not full auto calculation.
D: Developing	Significant portions are missing from spreadsheet.
F: Inadequate	Incomplete by missing most information.

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Info Sheet 1

Twelve Days of Christmas Lyrics

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

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

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

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

On the fifth day of
Christmas, my true love
sent to me
Five golden rings,
Four calling birds,
Three French hens,
Two turtle doves,
And a partridge in a pear
tree.

On the sixth day of
Christmas, my true love
sent to me
Six geese a-laying,
Five golden rings,
Four calling birds,
Three French hens,
Two turtle doves,

And a partridge in a pear
tree.

On the seventh day of
Christmas, my true love
sent to me
Seven swans a-swimming,
Six geese a-laying,
Five golden rings,
Four calling birds,
Three French hens,
Two turtle doves,
And a partridge in a pear
tree.

On the eighth day of
Christmas, my true love
sent to me
Eight maids a-milking,
Seven swans a-swimming,
Six geese a-laying,
Five golden rings,
Four calling birds,
Three French hens,
Two turtle doves,
And a partridge in a pear
tree.

On the ninth day of
Christmas, my true love
sent to me
Nine ladies dancing,
Eight maids a-milking,
Seven swans a-swimming,
Six geese a-laying,
Five golden rings,
Four calling birds,
Three French hens,
Two turtle doves,
And a partridge in a pear
tree.

On the tenth day of
Christmas, my true love
sent to me
Ten lords a-leaping,
Nine ladies dancing,
Eight maids a-milking,
Seven swans a-swimming,
Six geese a-laying,
Five golden rings,
Four calling birds,
Three French hens,
Two turtle doves,
And a partridge in a pear
tree.

On the eleventh day of
Christmas, my true love
sent to me
Eleven pipers piping,
Ten lords a-leaping,
Nine ladies dancing,
Eight maids a-milking,
Seven swans a-swimming,
Six geese a-laying,
Five golden rings,
Four calling birds,
Three French hens,
Two turtle doves,
And a partridge in a pear
tree.

On the twelfth day of
Christmas, my true love
sent to me
Twelve drummers
drumming, Eleven pipers
piping,
Ten lords a-leaping,
Nine ladies dancing,
Eight maids a-milking,
Seven swans a-swimming,
Six geese a-laying,
Five golden rings,
Four calling birds,
Three French hens,
Two turtle doves,
And a partridge in a pear
tree!

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Info Sheet 2
Historical Cost of Gifts

Gift	2010	2011	2012	2013	2014	2020
Partridge & Pear Tree	161.99	184.99	204.99	199.99	207.88	
2 Turtle Doves	100.00	125.00	125.00	125.00	125.00	
3 French Hens	150.00	150.00	165.00	165.00	181.50	
4 Calling Birds	599.96	519.96	519.96	599.96	599.60	
5 Golden Rings	649.95	645.00	750.00	750.00	750.00	
6 Geese	150.00	162.00	210.00	210.00	360.00	
7 Swans	5600.00	6300.00	7000.00	7000.00	7000.00	
8 Maids	58.00	58.00	58.00	58.00	58.00	
9 Ladies	6294.03	6294.03	6294.03	7552.84	7552.84	
10 Lords	4766.70	4766.70	4766.70	5243.37	5348.24	
11 Pipers	2356.20	2427.60	2562.00	2635.20	2635.20	
12 Drummers	2552.55	2629.90	2775.50	2854.80	2854.80	

Suggested Table for Costs

Day	New Present	Days Given	Number of Gifts Needed	Unit Price for Gift	Total Cost for this Gift	Daily Cost	Running Cost
1	Partridge in a Pear Tree		= (Day# * Days Given)	= the cost of ONE of this gift	product of what two numbers?	What are all the costs each day?	
2	Turtle Doves						
...	...						
12	Drummers Drumming						
		Total		Totals			