

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Spreadsheets, Functions, & 12 Days of Christmas

A spreadsheet is comprised of rows and columns. The **rows** are labeled **numerically**; the **columns** are labeled **alphabetically**. Each **cell** is found where a row and a column intersect and its address is noted with a letter and a number. A **function** is a mathematical relationship, which has only one **output** (answer) for each **input**. A graph is a representation of mathematical data.

### Essential Questions:

1. What tools are included in the Lists and Spreadsheets application that will help the student be more efficient, effective, and productive in examining numerical data?
2. How are functions used in a spreadsheet?
3. What difficulties could be encountered in learning how to use a spreadsheet, and how can these problems be overcome?

### Objectives:

1. Use correct terminology to identify the features of Lists and Spreadsheets.
2. Create a spreadsheet and use that spreadsheet to manipulate data.
3. Identify functions, choose applicable functions, and correctly enter those functions into the spreadsheet to analyze data.
4. "Purchase" a combination of items listed in "The Twelve Days of Christmas" to determine the total cost of the items.
5. Use functions to determine the percent of change in cost of the gifts from last year to the current year.

### I. TI-Nspire Lists and Spreadsheets

- A. After turning on the TI-Nspire handheld, Choose Home and select **3. Lists and Spreadsheets**. Press **Enter** or the **Click Button**.
  1. Highlight the white space just to the right of A in column A, type "cost06".
  2. While the space is still highlighted, press **MENU**. Highlighted is **1.ACTION**. Press the **RIGHT ARROW** on the navpad for **ACTION** choices.
  3. From this menu, highlight **2.Resize**, and press the **Click Button**.
  4. With the entire column highlighted, press the right arrow on the navpad to widen the column. Make sure the entire text is visible, then press the **Click Button**, then press ESC (escape).
  5. Highlight the white space just to the right of B in column B, type "cost07" and press ENTER.
  6. Use the same procedure on column B as you used on Column A to widen the column.

## II. Data

- A. How many of each gift does “my true love” give you?  
While listening to the song, “The Twelve Days of Christmas,” make a tally (mark) each time you hear each gift in the song.
- B. Now determine the total number of each gift given to you by “your true love.”

Gift	Tally	Frequency
One Partridge in a Pear Tree	IIII IIII II	12
A Pair of Turtle Doves	IIII IIII I	11
Three French Hens	IIII IIII	10
Four Calling Birds	IIII IIII	9
Five Gold Rings	IIII III	8
Six Geese-a-Laying	IIII II	7
Seven Swans-a-Swimming	IIII I	6
Eight Maids-a-Milking	IIII	5
Nine Ladies Dancing	IIII	4
Ten Lords-a-Leaping	IIII	3
Eleven Pipers Piping	II	2
Twelve Drummers Drumming	I	1

- C. In the next step, refer to [www.pncchristmaspriceindex.com](http://www.pncchristmaspriceindex.com) to find the current individual price of each gift in the song, and enter the values in the table below. Double-check all entries!!! If you don’t enter the correct numbers, you won’t get a correct answer!!!!
- D. Press **CTRL** (Control), then **Home** to access the Tools Menu. From this menu, select **2.Edit**. After scrolling right with the navpad, choose **7.Insert Page**, then **ENTER**. Select **1. Add Calculator**, **ENTER** or **CLICK BUTTON**. With your calculator, calculate the total cost of each gift, and enter in the table below.

Gift	Cost of one gift	Frequency	Total cost of gift
<b>Current Year:</b>			
One Partridge in a Pear Tree	164.99	12	1,979.88
A Pair of Turtle Doves	40	11	440.00
Three French Hens	45	10	450.00
Four Calling Birds	599.96	9	5,399.64
Five Gold Rings	395	8	3,160.00
Six Geese-a-Laying	360	7	2,520.00
Seven Swans-a-Swimming	4,200	6	25,200.00
Eight Maids-a-Milking	46.80	5	234.00
Nine Ladies Dancing	4,759.19	4	19,036.80
Ten Lords-a-Leaping	4,285.06	3	12,855.20
Eleven Pipers Piping	2,213.40	2	4,426.80
Twelve Drummers Drumming	2,397.85	1	2,397.85

E. In the next step, refer to [www.pncchristmaspriceindex.com](http://www.pncchristmaspriceindex.com) and find the previous year's individual price of each gift in the song, use your calculator screen to calculate the total cost of each gift at last year's prices, and enter the values in the table below. If the calculation is a repetition of a calculation on the current year, the calculator application allows you to scroll back up to that data to avoid repeating the same calculation.

Gift	Cost of one gift	Frequency	Total cost of gift
<b>Previous Year:</b>			
One Partridge in a Pear Tree	144.99	12	1,739.88
A Pair of Turtle Doves	40	11	440.00
Three French Hens	45	10	450.00
Four Calling Birds	479.96	9	4,319.64
Five Gold Rings	325	8	2,600.00
Six Geese-a-Laying	300	7	2,100.00
Seven Swans-a-Swimming	4,200	6	25,200.00
Eight Maids-a-Milking	41.20	5	206.00
Nine Ladies Dancing	4,759.19	4	19,036.80
Ten Lords-a-Leaping	4,160.25	3	12,480.80
Eleven Pipers Piping	2,124	2	4,248.00
Twelve Drummers Drumming	2,301	1	2,301.00

### III. Data Analysis, Functions

You are now ready to enter values and functions in the cells of your spreadsheet. Press **CTRL**, then the left arrow on the navpad to move back to page 1, Lists and Spreadsheets.

- A. Beginning in Cell A1, manually enter the 2006 true cost of the each gift in the rows of column A.
- B. Beginning in Cell B1, manually enter the 2007 true cost of each gift in the rows of column B.
- C. Highlight the white space just to the right of C in column C, type "Change."
- D. Widen the column with the same procedure used to widen columns A and B.
- E. Highlight the shaded space below the C, and enter the function " $=\text{cost06}-\text{cost07}$ " then ENTER. The change in cost for each item is now displayed in column C. You may need to widen this column.
- F. Highlight the white space just to the right of D in column D, type "percentofchange". Widen the column to display the heading.
- G. Highlight the shaded space below the D, and enter the function " $=\text{change} \times 100 \div \text{cost06}$ " then ENTER. The percent of change in the cost of each item from 2006 to 2007 is displayed.
  - a. Justify the selection of this function to find percent of change of each item.
  - b. Which item had the greatest percent of change? Explain the reason the change may have been greater than other changes.
  - c. Which items did not change? Explain why no change occurred.