

Spreadsheet Magic by Pamela Lewis

[Visual Learning](#)

[Higher Order Thinking](#)

[Spreadsheet and Mathematics](#)

[Spreadsheet skills mastered by students K-8, Templates used](#)

[Internet Resources](#)

[Spreadsheet Magic](#)

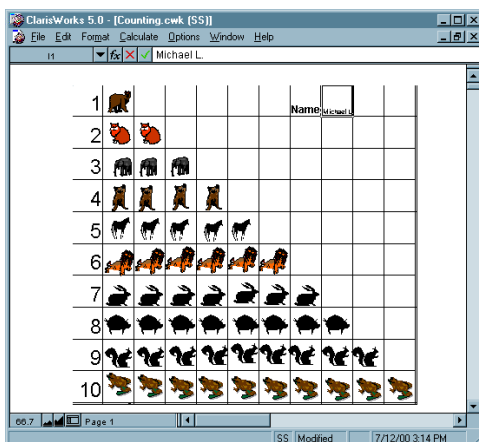
[About the author](#)

A powerful tool for visual learners

Students use color and pattern to fill cells on the grid. They use the grid for counting, doing math problems and making color patterns. In the first example below, they count to 100, notice number patterns, count in multiples and shade those cells. In the second example, cell borders are selectively hidden or shown and this is useful for learning fractions or making number lines.

4										
5	1	2	3	4	5	6	7	8	9	10
6	11	12	13	14	15	16	17	18	19	20
7	21	22	23	24	25	26	27	28	29	30
8	31	32	33	34	35	36	37	38	39	40
9	41	42	43	44	45	46	47	48	49	50
10	51	52	53	54	55	56	57	58	59	60
11	61	62	63	64	65	66	67	68	69	70
12	71	72	73	74	75	76	77	78	79	80
13	81	82	83	84	85	86	87	88	89	90
14	91	92	93	94	95	96	97	98	99	100
15										
17	Count by 2s		(Fill with red)							
18	Count by 5s		(Underline)							
19	Count by 3s		(Fill with pattern)							

Fractions		Name: <input type="text"/>
Each bar represents one unit. Shade the fraction:		
1/4		
3/10		
3/8		
5/8		
37/40		
9/10		
7/40		
3/5		
3/4		
7/8		



Students insert **Clip Art** to count on computer, make their own pictographs, make bingo boards, calendars. Free Clip Art can be found on the Internet, at sites like Microsoft Design Gallery (<http://dgl.microsoft.com/>). Students copy a picture from the Internet, by right-clicking it using a PC, or by holding down the mouse using a Mac, they select copy, return to the spreadsheet application, and paste the picture into the appropriate cell. They must acknowledge the source of pictures copied and observe copyright restrictions.

Promote higher order thinking

Spreadsheet formulas are entered on templates for students so that the computer does calculations for them and they focus on problem

solving: in one assignment they spend a target amount at a toy store, and in another they make change for a target amount. Higher order thinking skills develop when students make their own formulas to manipulate numbers: they explore why formulas are used and how changing one variable affects the numbers generated in cells. They use formulas to count the cells in a spreadsheet, to generate a multiplication table, to generalize a rule, make magic squares, do conversions, and to make a calculator.

Organize information

Columns and rows organize data and pictures, for example to make an animal classification table. Students copy and paste information from the Internet into spreadsheet columns, for example when planning a trip to a foreign country.

[Back to the top](#)

• **Teach Mathematics**

Assignments demonstrated show the following:

- Counting on the grid, using pictures or numbers. Patterns become evident and students notice their own mistakes, as they see, for instance, that every number at the end of the row in the hundreds chart should end in a zero.
- Doing Math problems, adding and subtracting with the grid as a visual aid
- Making a budget to spend a target amount at a toy store and problem solving when the rules change and they have less money than expected to spend
- Using coordinates as they enter numbers in assigned cells on the grid
- Making arrays by formatting borders selectively around cells
- Making a multiplication table on the grid, first calculating the products themselves, then checking it by having the computer make the calculations for them
- Making change and make conversions with the help of formulas
- Making a magic square with or without formulas
- Making a pictograph or bar graph (First graders have fun with this)
- Making computer generated charts and interpreting them, making predictions based on an understanding of information on charts as students count M&M's and sort them by color, then try to predict the total number for each color in the one unopened bag. They interpret the charts to make comparisons and analyze their findings.
- Using the grid, borders, filling cells with color to help visualize fractions and decimals, making number lines to compare fractions, decimals, positive and negative numbers. The number line is also used to make time lines for Social Studies or Language Arts.
- Using formulas and predicting how changing one variable will affect the outcome. Exploring when formulas can and cannot be generalized. Students use formulas to find the rule, making conversions, making a calculator and calculate their own grades.

[Back to the top](#)

• **Skills learned K-8 - Use Templates**

Students as young as kindergartners can use spreadsheets with the help of templates where formatting has been done for them and they focus on the task at hand, for instance, they duplicate pictures as they count to ten on the grid, or fill in the numbers from one to ten. They concentrate on counting, or on making a pattern, gradually developing their computer skills. By eighth grade, students understand the use of spreadsheets and can create a new spreadsheet for their purposes. They are able to do the following:

- Move through a spreadsheet (arrows, tab, enter, home, end)

- Duplicate graphics and move them into cells
- Enter and format text and numbers in cells (change font, color, size, bold)
- Add Clip Art, resize it
- Find pictures online and paste them into a Spreadsheet
- Fill cells with color or pattern
- Create graphs/charts, both computer-generated and their own
- Format borders so that they show around some or all cells
- Sort data in alphabetical or numerical order
- Use the Thesaurus and Spell Check
- Use readymade formulas and make up new ones
- Generalize formulas by filling right or down
- Set display options – show or hide the grid, and column and row headings
- Set print options

[Back to the top](#)

• **Internet Resources**

Tutorials for teachers to learn to use Spreadsheets:

Description	Web Address
Apple's Spreadsheet tips	http://www.apple.com/education/k12/products/appleworks/tips/index.html#spreadsheet
In and out of the classroom with Microsoft Excel	http://www.microsoft.com/education/tutorial/classroom/excel97/default.asp
Macintosh Tips and Tutorials – Spreadsheet tutorials	http://home.earthlink.net/~ohora/spreadsheet/index.html

Examples of real data that can be used to make spreadsheets

Description	Web Address
A Weekend in Paris – links for a weekend trip.	http://www.kn.pacbell.com/wired/fil/pages/listleweekeba.html
Calculates the distance between cities as the crow flies	http://www.indo.com/distance/
Database of information about the planets.	http://www.planetscapes.com/solar/eng/query.htm
M&M's industrial Candy home page	http://www.m-ms.com/factory/history/faq1.html
Number base converter	http://www.math.com/students/converters/source/base.htm
Olympic Medal results by NBC	http://sydney2000.nbcolympics.com/
State and County quick facts from the Census Bureau	http://quickfacts.census.gov/qfd/
Weather Underground – historical weather data	http://www.wunderground.com/

Resources for teaching the Mathematical concepts mentioned above:

Ask Dr. Math	http://forum.swarthmore.edu
Fractions assignments	http://math.rice.edu/~lanius/fractions/
Allmath.com	http://www.allmath.com

Math.com	http://www.math.com
National Council of Teachers of Mathematics - Standards for School Mathematics	http://standards.nctm.org/document/chapter3/index.htm
Aplus Math	http://www.aplusmath.com
Math Games	http://www.mathgames.com
Edhelper - Free Math worksheets	http://www.edhelper.com/math.htm

Websites for integrating spreadsheets:

MS Excel Resources	http://www.sabine.k12.la.us/class/excel_resources.htm
Integrating spreadsheets across the curriculum	http://www.kn.pacbell.com/wired/fil/pages/1istspreadshli.html

[Back to the top](#)

- ***Spreadsheet Magic***

by Pamela Lewis has recently been published by ISTE (International Society for Technology in Education: <http://www.iste.org>). It includes an appendix entitled "Teacher, Teach Yourself!" with instructions for mastering the skills. There are more than 40 lessons in the book with detailed descriptions for doing the assignments. It includes a CD-ROM with templates and samples of completed assignments. National standards met by each assignment are listed for Technology, Mathematics, and other subjects.

- ***About the author***

Pamela Lewis works as Technology Coordinator at St. Luke School in Brookfield WI. She trains teachers on computer for the Archdiocese of Milwaukee "Train the Trainer" program and teaches graduate computer classes for St. Mary's University of Minnesota Outreach program. She has presented on Spreadsheets and other topics at several conferences, both local and national. E-mail:

pamlewis@execpc.com

[Back to the top](#)