Serious Fun in the Mathematics Classroom:

An Overview

"…so much of what we learn takes place in play…"

Prepared exclusively for educators attending the
National Council of Teachers of Mathematics

Annual Meeting and Exposition

Philadelphia Pennsylvania
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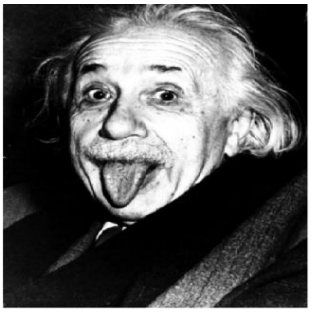
Dear Colleague,

Thank you for joining us today for an overview of *"Serious Fun in the Mathematics Classroom"*. It is our sincere pleasure to be in the City of Brotherly Love, sharing our true passion of learning. While everyone in this session benefit from your participation and contributions, it is your students who will ultimately gain as a result of your efforts today…and you, too, will have more fun and be even MORE successful!

Teaching and Learning Connected (TLC) offers professional development opportunities to help students achieve at higher levels; providing educators with the tools and research to make the important connection between the work of teachers and the learning of students. This work can be customized to fit your individual needs or may be presented as a regional session. A variety of topics are available, such as, Building Leadership Capacity, Effective Questioning Techniques, Instructional Theory Into Practice, Mathematics (Curriculum, Instruction and Assessment), Multiple Intelligences, MORE Serious Fun in the Classroom, *Study Strategies for Student Success*©, Teaming for Success, Thinking Maps® and True Colors™.

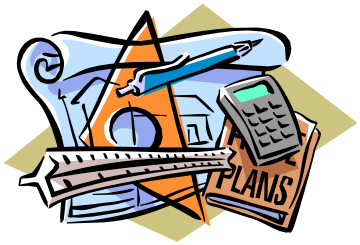
Please contact us for more information about TLC and visit our blog at http://www.tlconnected.com/blog to continue the learning from our morning. Enjoy the rest of the conference and we look forward to working with *you* again soon and having some VERY serious fun!

Think Success, Think TLC!



Things That Make Math Teachers Fun

(and *maybe* a little serious…)



- Can be used as a "Shout out" on *Cash Cab*
- Able to figure out how many square feet of wallpaper a trapezoidal bedroom with six oval windows will require
- Freely allow their students to wield pointy compasses
- Know when it's respectable to use a calculator and when it isn't
- Good to do overseas travel with – can compute the dollar equivalent of foreign currencies in their heads
- Happy to figure out the tip
- Good tax estimators
- Would have been totally prepared if the metric system had been adopted in the United States
- Really understand the difference between half and a third off
- Actually use the math their teachers always told them they'd need to know in adult life
- Are not fazed by negative numbers
- Could work in base eight if they had to

From "1003 Great Things About Teachers" by Birnbach, Marx, Hodgman© 2000; Compiled by Hirst-Loucks and Loucks, 2012.

Words

As a fun way to practice adding integers, you're going to have an opportunity to do an activity that involves finding the "dollar value" of words. All you have to do is find the sum of all the letters in the word. Below is the alphabet with the "dollar values" of each letter. Notice that the vowels have negative values:

A	B	C	D	E	F	G	H	I	J	K	L	M	N	0	P	Q	R	S	T	U	V	W	X	Y	Z
-1	0	1	2	-2	3	4	5	-3	6	7	8	9	10	-4	11	12	13	14	15	-5	16	17	18	19	20

Here's an example with "birthday": The "value" is $50.

B	I	R	T	H	D	A	Y
0	+ (-3)	+ 13	+ 15	+ 5	+ 2	+ (-1)	+ 19

Now, try practicing by finding the "values" of a few words. List each letter and its value and show how you calculated the "value" of each word.

1. MATH
2. Your first name
3. Your last name

Find as many words (they must be from the English language) as you can that have a value of EXACTLY **$50** (feel free to use the word "birthday"). Be sure to include the values of each letter and how you calculated the value of each word. Do them JUST like the example with "birthday" at the top of this page: letters spread out with the values underneath, showing a sum of $50. ANY kind of word will be accepted: proper names, hyphenated words, etc.

There ARE some $100 words out there! What other unique and fun "values" can you find?

KenKen is a logic puzzle with very simple rules:

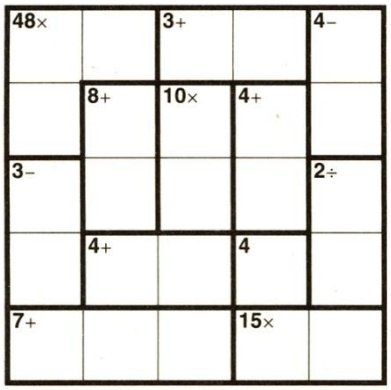
- Fill the grid with digits so as not to repeat a digit in any row or column.
- Digits within each heavily outlined group of squares, called a cage, must combine to make the arithmetic result indicated.
- A 3 X 3-square puzzle will use the digits from 1 to 3; a 4 x 4-square puzzle will use the digits from 1 to 4, etc.

Solving a KenKen puzzle involves pure logic and mathematics. No guesswork is needed. Every puzzle has a unique solution. The puzzles use all four arithmetic operations – addition, subtraction, multiplication, and division – in the following manner:

- In a cage marked with a plus sign, the given number will be the sum of the digits you enter in the squares.
- In a cage marked with a minus sign, the given number will be the difference between the digits you enter in the squares (the lower digit subtracted from the higher one).

To start, fill in any digits in 1 X 1 sections-in this puzzle, the 4 in the fourth row.

Next, look for sections whose given numbers are either high or low, or that involve distinctive combinations of digits, since these are often the easiest to solve. For the puzzle to the right, the upside-down L-shaped group in the upper left has a product of 48. The only combination of three digits from 1 to 5 that multiplies to 48 is 3, 4, and 4. Since the two 4s can't appear in the same row or column, they must appear at the ends of the L. The 3 goes between them.



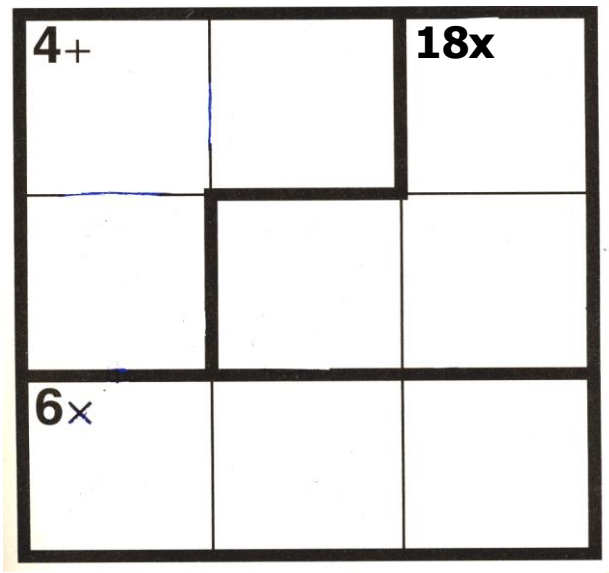
Now look at the pair of squares in the first row with a sum of 3. The only two digits that add up to 3 are 1 and 2. We don't know their order yet, but this information can still be useful.

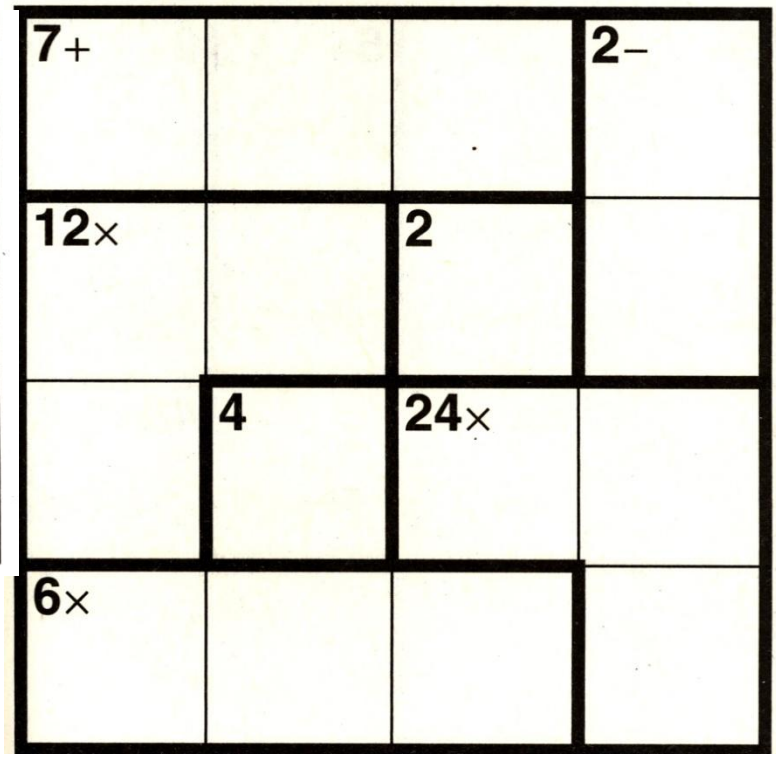
Sometimes, the next step in solving a KenKen puzzle is to ignore the given numbers and use sudoku-like logic to avoid repeating a digit in a row or column. For example, now that 1, 2, 3, and 4 have been used or are slated for use in the first row, the remaining square (at the end of the row) must be a 5. Then the digit below the 5 must be a 1 for this pair of squares to have a difference of 4.

Next, consider the pair of squares in the third column with a product of 10. The only two digits from 1 to 5 that have a product of 10 are 2 and 5. We don't know their order yet. However, the digit in the square above them, which we previously identified as either a 1 or a 2, must be 1, so as not to repeat a 2 in this column. The 2 that accompanies the 1 goes to its right.

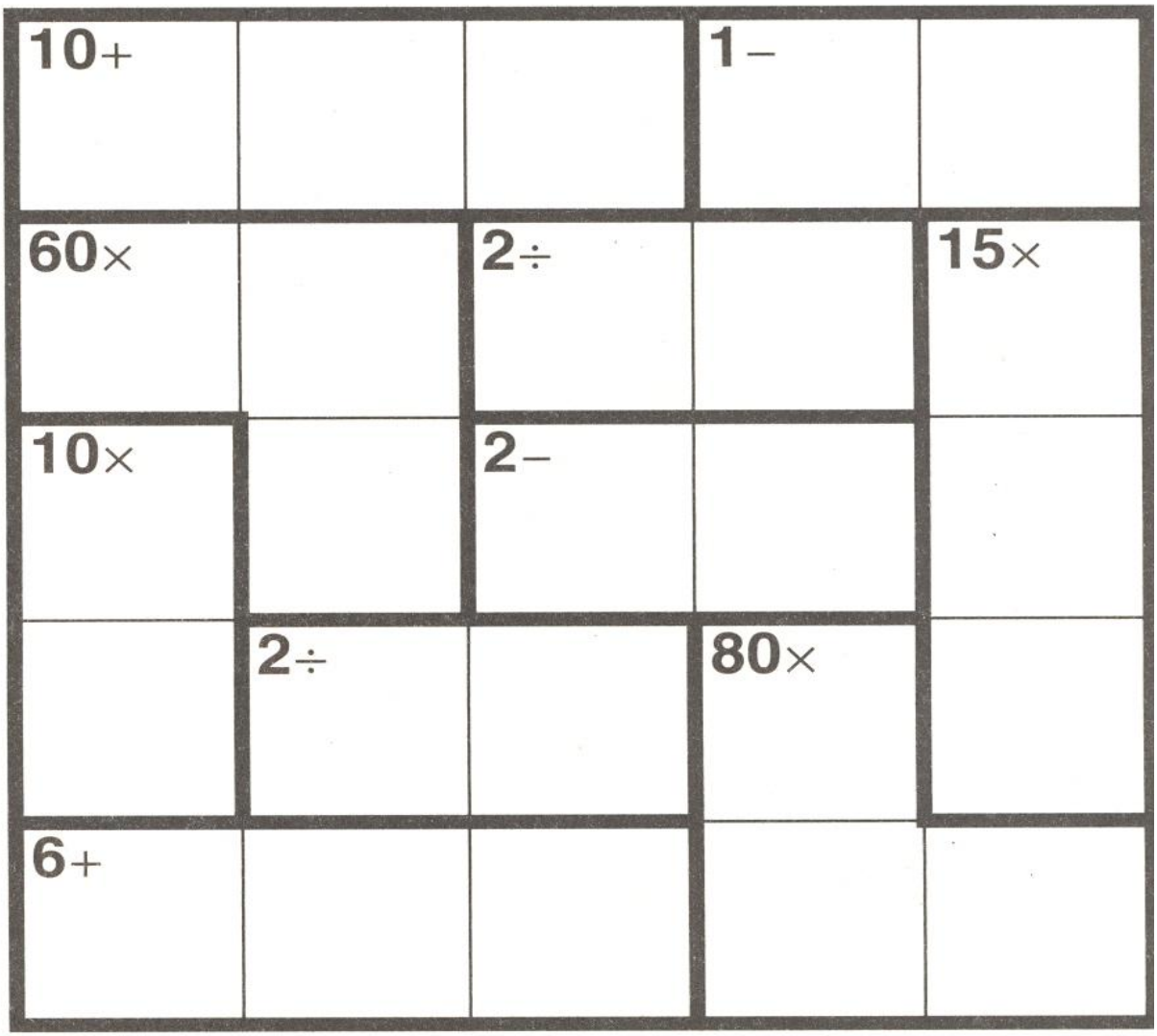
Continuing in this way, using these and other techniques left for you to discover, you can work your way around the grid, filling in the rest of the squares. (You don't have the solution since you probably won't need it!)

From *KenKen: Easy to Hard – Volume 3* by Will Short z. St. Matrin's Griffin, New York, New York, 2008.





See the Will Shortz intro video!
http://www.youtube.com/watch?v=eik2syOmwSM



CALCULATOR GAME BOARD Multiplication

- ★ Players or teams take turns.
- ★ On each turn, the player chooses two numbers from the Factor Pool and finds their product. A calculator may be used.
- ★ The player then finds on the board the rounded number that is **closest to the product,** and places a marker on that number.
- ★ The first player to have four markers in a row, horizontally, vertically or diagonally, wins the game.

Factor pool: 3, 23, 31, 47, 16, 18, 17, 59, 13

140	1460	180	940	390	1830
370	850	1080	210	50	1060
750	70	270	410	30	220
710	300	500	90	310	40
290	560	50	800	1360	770
50	610	1000	2770	230	400

From *Family Math* by Stenmark, Thompson and Casey. Lawrence Hall of Science, Berkeley CA: 1986