

PRIME $\mu\alpha + h$ gazine

Rectangle Ruckus!!!

I. 1-by- n

	A	A B	A B C	A B C D
Figure Number:	1	2	3	4
Number of Rectangles:	1	3	6	10
	A	A, B AB	A, B, C AB, BC ABC	A, B, C, D AB, BC, CD ABC, BCD ABCD

The pattern continues.

How many rectangles are in:

1. Figure 5? _____

2. Figure 6? _____

3. Figure 9? _____

4. Figure n ? R = _____

Win the 2011-2012 STEMatician Award

When you send in solutions, we score and keep track of your score.

Solutions for this issue due January 1, 2012. Awards in July 2012.

3 ways to submit:

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**PRIME
CENTER**

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Rectangle Ruckus Returns!!!

II. 2-by- n

A
B

A	B
C	D

A	B	C
D	E	F

A	B	C	D
E	F	G	H

Figure Number: 1 2 3 4

Number of
Rectangles: 1 9 18 30

A, B
AB A, B, C, D
AB, CD, AC,
BD ABCD A, B, C, D, E, F
AB, BC, DE, EF, AD, BE, CF
ABC, DEF
ABDE, BCEF
ABCDEF

The pattern continues.

How many rectangles are in:

1. Figure 5? _____ 2. Figure 6? _____
3. Figure 9? _____ 4. Figure n ? R = _____

Serious Squares!!!

For each pattern, identify the next three terms, the 100th term and the n th term.

	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	100 th	n th
1.	1/3	8/3	27/3	64/3	125/3	_____	_____	_____	_____	_____
2.	6	9	14	21	30	_____	_____	_____	_____	_____
3.	4	11	30	67	128	_____	_____	_____	_____	_____

Factors Please!

What kinds of numbers have:

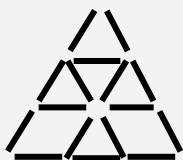
1. Exactly two factors?
2. Exactly three factors?
3. Exactly five factors?

What is the sum of the factors of a counting number if it:

4. Is a prime number?
5. Has exactly three factors?

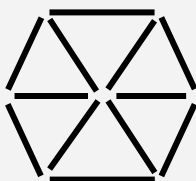
Toothpick Challenge!!!

1.



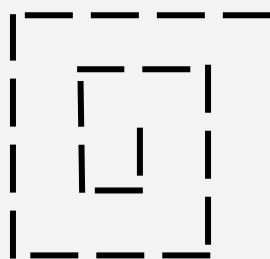
Move 6 toothpicks from the triangle so that 5 triangles remain. Draw the picture.

2.



Move 3 toothpicks from the hexagon so that 6 quadrilaterals are formed. Draw the picture.

3.



Move 4 toothpicks to change the design into 3 non-congruent squares. Draw the picture.

Balzano

Balzano is a puzzle that will tap into your logical reasoning abilities. Read the directions carefully, then try your hand at Balzano Shapes.

Directions:





















Your job is to figure out the Desired Arrangement of three or more shapes from clues that provide information about the shapes and their locations. Each clue consists of two parts.

The **Arrangement Column** shows sets of shapes in rows. In the Balzano below, the second row is arranged in order from left to right, square, square, circle, triangle.

Correct Shape in the Correct Position identifies the number of shapes that are in the Desired Arrangement AND in the right positions. The second row has zero shapes that are in the Desired Arrangement and in the right positions.

Correct Shape in the Wrong Position identifies the number of shapes in the Desired Arrangement that are the right shapes BUT not in the right positions. There are three of these in the second row.

Incorrect Shape identifies the number of shapes that are not in the Desired Arrangement. There is one of these in the second row. This means that one of the three shapes does not belong in the Desired Arrangement.

Arrangement	Correct shape in correct position	Correct shape in wrong position	Incorrect shape
   	2	2	0
   	0	3	1
   	0	4	0
   	2	1	1
   	2	0	2
	4	0	0