



# Math Magical Circles

Ludic and mnemonic method to master basic math facts

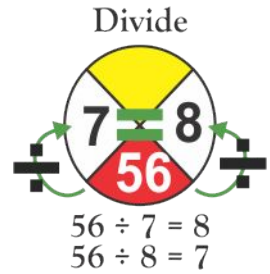
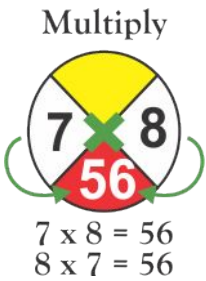
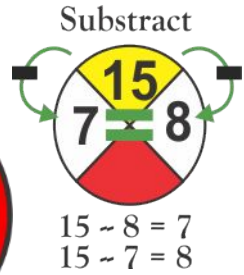
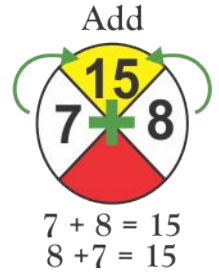
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# What is a Math Magical Circle? (MMC)

A MMC is an image or character with a circular shape and 4 numbers inside of it, where 2 additions, 2 subtractions, 2 multiplications and 2 divisions can be interpreted.



## MMC are only 36

- Multiplication tables of 1 and 10 were suppressed – a simple arithmetic rule can be taught to children.
- Commutative property is present (a 7x8 MMC exists but a 8x7 is not needed)

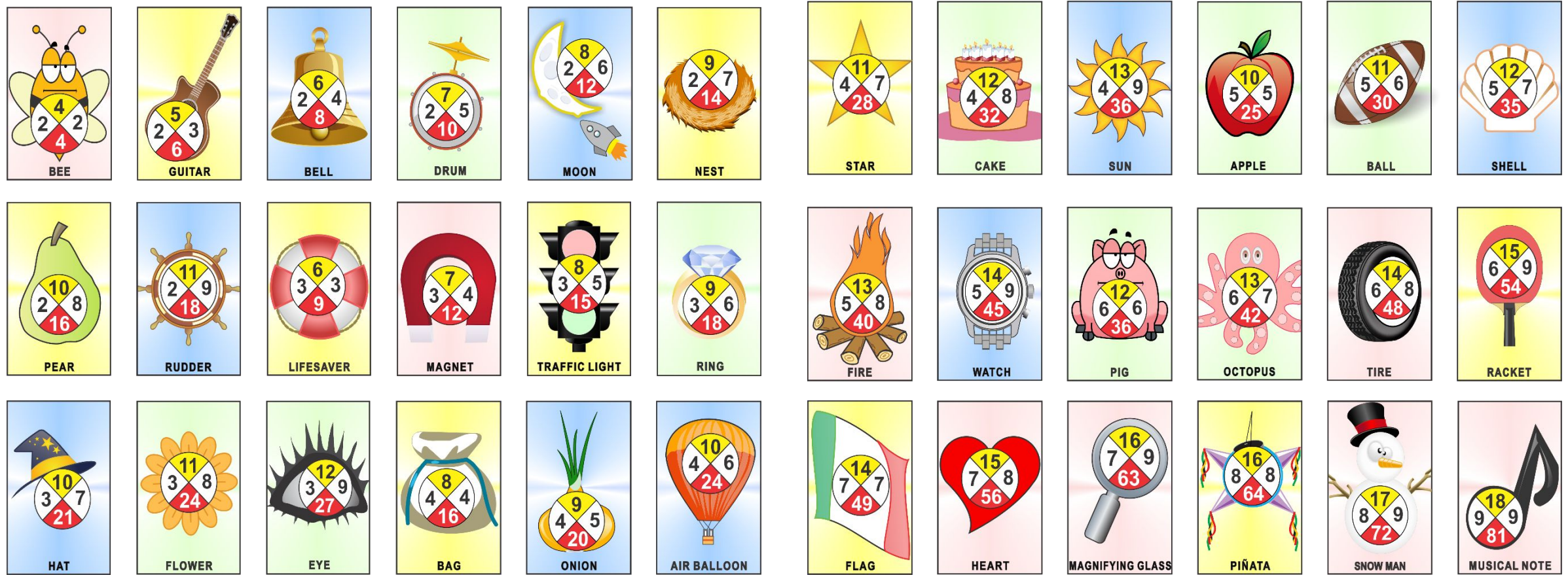
	1	2	3	4	5	6	7	8	9	10
1	1x1	2x1	3x1	4x1	5x1	6x1	7x1	8x1	9x1	10x1
2	1x2	2x2	3x2	4x2	5x2	6x2	7x2	8x2	9x2	10x2
3	1x3	2x3	3x3	4x3	5x3	6x3	7x3	8x3	9x3	10x3
4	1x4	2x4	3x4	4x4	5x4	6x4	7x4	8x4	9x4	10x4
5	1x5	2x5	3x5	4x5	5x5	6x5	7x5	8x5	9x5	10x5
6	1x6	2x6	3x6	4x6	5x6	6x6	7x6	8x6	9x6	10x6
7	1x7	2x7	3x7	4x7	5x7	6x7	7x7	8x7	9x7	10x7
8	1x8	2x8	3x8	4x8	5x8	6x8	7x8	8x8	9x8	10x8
9	1x9	2x9	3x9	4x9	5x9	6x9	7x9	8x9	9x9	10x9
10	1x10	2x10	3x10	4x10	5x10	6x10	7x10	8x10	9x10	10x10

36 multiplicaciones de los CMM



# The entire MMC's image collection

Every math fact has its own powerful and distinctive image to be remembered and not confused with any other image or math fact. This is an important thing: now, every math fact has its own personality and will not be confused with any other, ever again.



# Mnemonics and ludic are the foundations

**MMC method relies in mnemonics.** While a picture or movie can be remembered for a long period of time, a phone number can be forgotten in 5 minutes, just because our brain struggles building a logic connection when numbers are involved, to recover or reconstruct the memory (data). Images, stories and phrases, are used by MMC to help children build all the mental connections needed to remember the picture and its numbers. By knowing how to read a MMC, 8 basic math operations are remembered all at once.



### Mnemonic phrase example

“in 1,2,3 the 6 strings I shall play, and if I break one, 5 will remain”

**While playing, children take a “mental picture” of each MMC. Helped by images and stories, the infant brain builds its synaptic connections to save data (the whole MMC and its numbers).**

**MMC relies on games.** When playing MMC games, the wall between children and math is teared down. Repetitive tasks are performed (those needed to memorize), with no hesitation or boredom. Collaborative and integrated groups are built.





# 3 Main games and 15 additional groupal activities

(To set up study sessions)

With the MMC collection, teaching materials were designed to create 3 classic....

## Board games:

- Bingo (in Mexico known as lottery)
- Memory game (the classic)
- Big head (flash cards)

...in every activity and game rule, fun and mnemonics are present.



# Bingo (Mexican lottery)



### Special features:

- Bingo game has 9 cardboards
- Every cardboard is a entire multiplication table
- Every carboard has 8 MMC ( 1xN or 10xN MMC do not exist)
- All MMC are ordered (see figure)
- Every MMC can be found in 2 cardboards
- Every cardboard has a short story to help memorization process (story technique)

2	3	4
5	#	6
7	8	9

Ordered pattern

### Short stories

“Fast little bee”



“Sleepy bee”



“Who’s the boss”



“Smelly birthday”



“Noisy”



“Jealous moon”



“The great idea”



“The wish”



“Rudder’s lost handle”





# Teacher's book

## Teacher's book contains:

- Method explanation
- 57 study sessions
- 15 games and activities explanations
- 9 short stories
- 1 student evaluation model





# Math and other skills

MMC method help children develop a variety of abilities and skills

## MMC

### **Math**

The main goal is to master math facts, but number recognition, counting, Major-Minor comparison, numerical series and pre algebraic knowledge can also be learned.

### **Memory and cognitive**

Short, long, visual, auditory memory development; memory patterns development; improves attention, perception and concentration; visual and spatial processing and trains executive functions, among others

### **Motor and Kinesthetic**

Games and activities improves eyes and hands coordination; knowing body strength and movements; materials manipulation;

### **Social**

Games and activities help children develop several social skills needed to interact with partners. Taking turns, follow rules, group work, friendship, creativity, emotional intelligence, etc.

### **Language and Communication**

Stories and proposed activities teach new words and meanings, reading, writing, listening, comprehension.



**The next slide shows the results  
of an intervention in a 6th  
grade elementary school group**



## 6th Grade Group

5 week intervention

Student	Diagnosis test	Final test	Difference	%
1	7	10	3.0	43%
2	7	9.5	2.5	36%
3	6	8	2.0	33%
4	5	9	4.0	80%
5	5	7	2.0	40%
6	9	9.5	0.5	6%
7	9	10	1.0	11%
8	8	10	2.0	25%
9	8	9.5	1.5	19%
10	6	8.5	2.5	42%
11	5	9	4.0	80%
12	7	10	3.0	43%
13	6	8	2.0	33%
14	3	7.5	4.5	150%
15	5	8	3.0	60%
16	5	8	3.0	60%
17	5	8	3.0	60%
18	4	7.5	3.5	88%
19	9	10	1.0	11%
20	2	7.5	5.5	275%
21	5	8	3.0	60%
22	9	9.5	0.5	6%
23	5	9	4.0	80%
24	8	9	1.0	13%
25	5	8	3.0	60%
26	6	8	2.0	33%
27	5	8	3.0	60%
28	7	9	2.0	29%
29	7	9.5	2.5	36%
30	6	9	3.0	50%
31	9.5	10	0.5	5%
32	3	8	5.0	167%
<b>Average</b>	<b>6.1</b>	<b>8.7</b>	<b>2.6</b>	<b>56%</b>

# Group intervention results

## "Leo Sandoval" Elementary School - Hermosillo, México

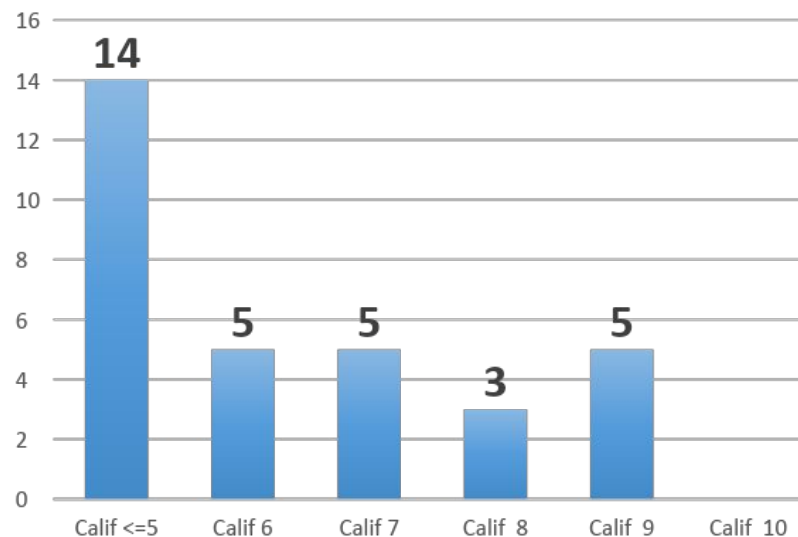
Tests results comparison before and after intervention with Math Magical Circles.

Study sessions frequency: 20 minutos, 3 times a week.

In Mexico, grades are from 0 to 10, where 6 is the minimum approbatory grade.

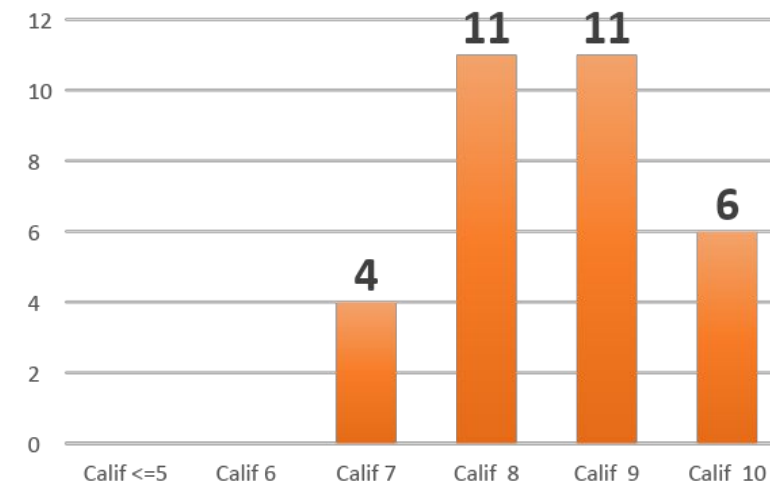
### "Leo Sandoval" Elementary School

Diagnostic Test Results



### "Leo Sandoval" Elementary School

Final Test Results



### Students Grades Summary

Test grade	Diagnosis	Final
<=5	14	0
6	5	0
7	5	4
8	3	11
9	5	11
10	0	6
<b>Students total</b>	<b>32</b>	<b>32</b>

### Remarks



Intervention lasted 5 weeks, with a frequency of 3 weekly 20 minutes sessions.



ALL students improved their grades.



In the final test, the lower grade was 7



# More info...

Here is a video, with testimonies of authorities of the Secretary of Education of Sonora State (México), school directors, teachers, students and parents

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<https://circulosmagicos.com/en/home/>

There is a lot more info, pictures, reports, videos, testimonies and students test I can provide.

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Thanks in advance for your time.

Sincerely,

Krupshupsky

