

## NINE DAYS IN ONE SECOND

*This activity might be used during our show,  
Please use it only after the performance!*

Math skills: Addition and multiplication  
You will need: Calendar and calculator  
 (or paper and pen)  
Difficulty level: 3

Introduction: Tell your students that you can add the sum of nine days on the calendar faster than they can on their calculators!

What to do: Ask a volunteer to mark on any page a group of 9 days in a box of 3x3 (see example)

Ask your students to add those nine days together on their calculators on papers while you tell them the sum (adding in your head) first.

**How it works:** The key to understanding this trick is based on the consecutive order of the numbers in the calendar. All you have to do is to take the central number and multiply it by 9 ( $10 \times 9 = 90$ ) While they are adding  $2+3+4+9+10+11+16+17+18=90!$

**Why it works:** Let A be the central number of the 3x3 square of numbers from the calendar. Then the numbers have the following values:

The sum of the numbers is:

A-1-7	+	A+1+7	=	2A
A-7	+	A+7	=	2A
A-1-7	+	A+1+7	=	2A
A-1	+	A+1	=	2A

A-1-7	A-7	A+1-7
A-1	A	A-1
A-1+7	A+7	A+1+7

These pairs sum to 8A and with the central number added to 9A.

A is the average value of all nine numbers, because the central number is A and all other numbers differ from A but can be paired with an opposite number that differs by the same increment in the opposite direction.



						1
2	3	4	5	6	7	8
9	10	11	2	13	14	15
16	17	18	9	20	21	22
23	24	25	26	27	28	29
30	31					