

80	79	78	77	76	75	74	73
72	71	70	69	68	67	66	65
64	63	62	61	60	59	58	57
56	55	54	53	52	51	50	49
48	47	46	45	44	43	42	41
40	39	38	37	36	35	34	33
32	31	30	29	28	27	26	25
24	23	22	21	20	19	18	17
16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1

Mathematical Magic

By Nancy
Blachman
JRMF.org



Inspire Curiosity

How can you inspire curiosity about mathematics?

Make it enticing, engaging, and fun.

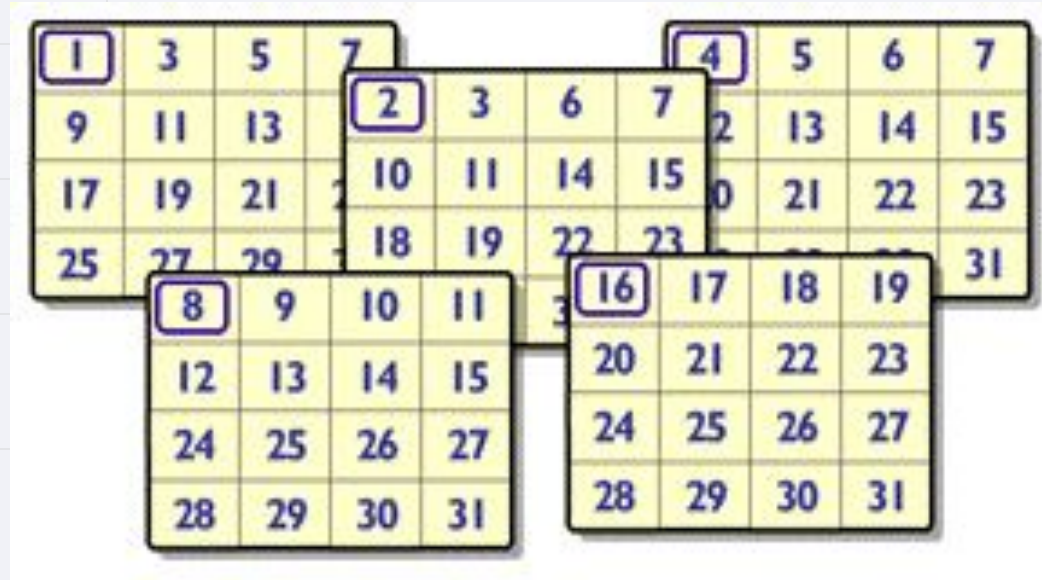


Guess the Number

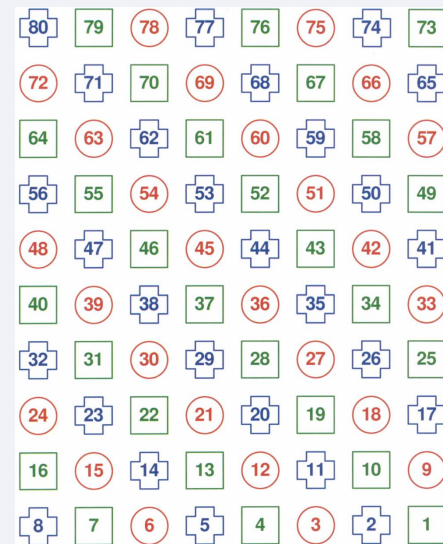
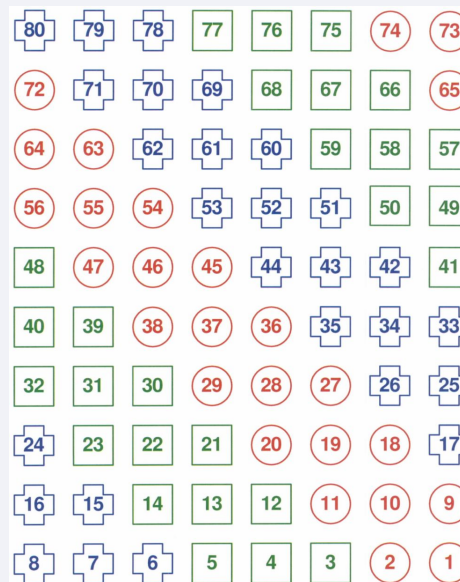
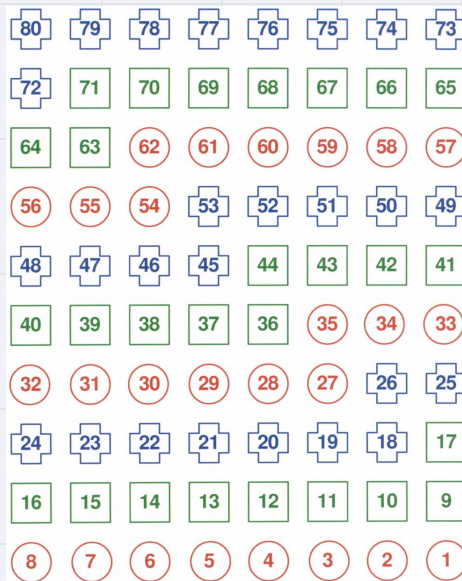
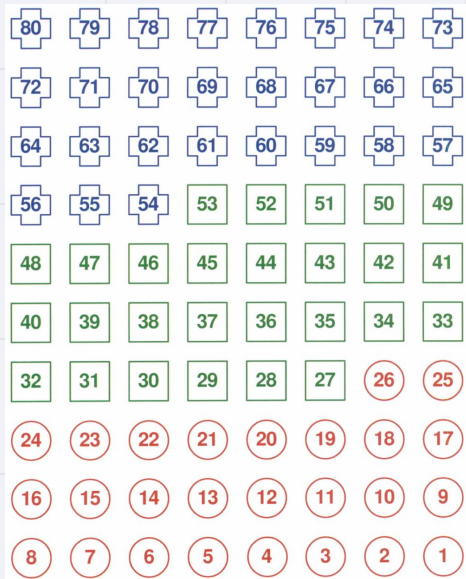
When searching for activities, I found

Guess the Number Magic Trick.

Magic: Add up the numbers in the left upper corners of the cards specified.

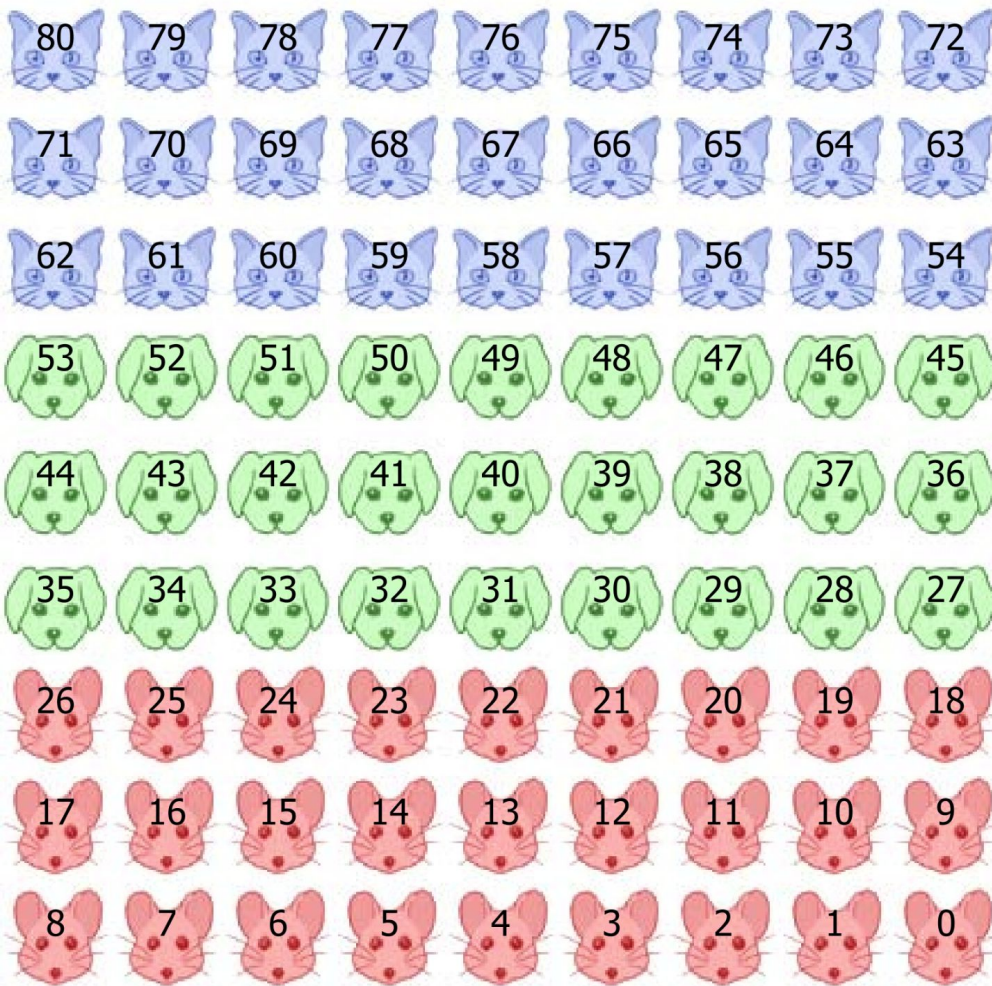


A Variation of the Trick



Making it friendly





Instructions

Ask someone to choose a
secret number between
0 and 80.

Ask them tell you the
animal or color
that is on their
number
on each of the four cards.



Cat, Dog, & Mouse Magic Cards

80	79	78	77	76	75	74	73	72
71	70	69	68	67	66	65	64	63
62	61	60	59	58	57	56	55	54
53	52	51	50	49	48	47	46	45
44	43	42	41	40	39	38	37	36
35	34	33	32	31	30	29	28	27
26	25	24	23	22	21	20	19	18
17	16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1	0

1

80	79	78	77	76	75	74	73	72
71	70	69	68	67	66	65	64	63
62	61	60	59	58	57	56	55	54
53	52	51	50	49	48	47	46	45
44	43	42	41	40	39	38	37	36
35	34	33	32	31	30	29	28	27
26	25	24	23	22	21	20	19	18
17	16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1	0

2

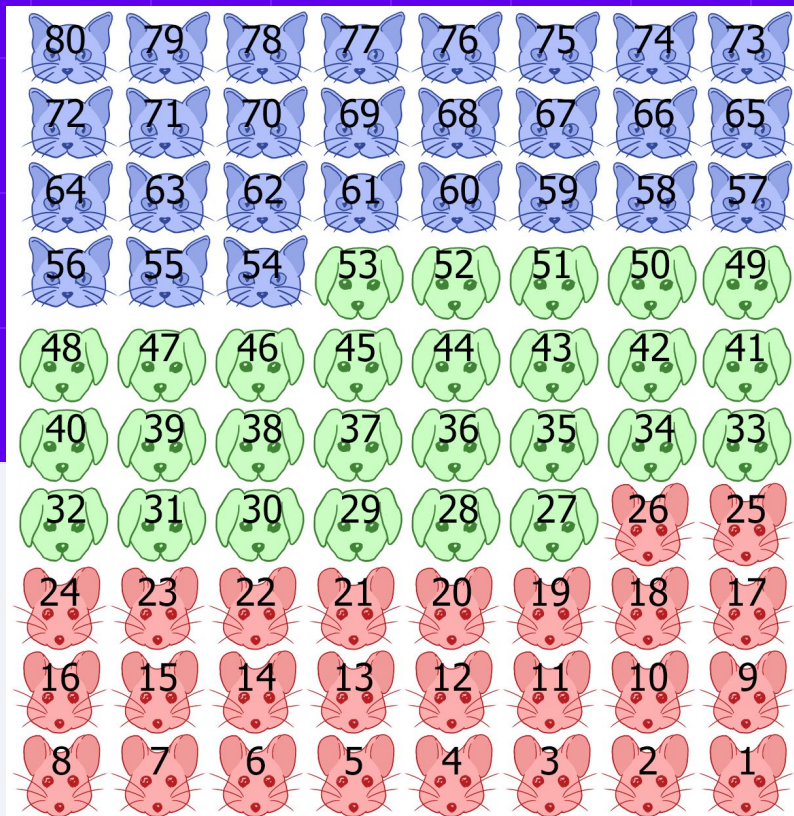
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71	70	69	68	67	66	65	64	63
62	61	60	59	58	57	56	55	54
53	52	51	50	49	48	47	46	45
44	43	42	41	40	39	38	37	36
35	34	33	32	31	30	29	28	27
26	25	24	23	22	21	20	19	18
17	16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1	0

3

80	79	78	77	76	75	74	73	72
71	70	69	68	67	66	65	64	63
62	61	60	59	58	57	56	55	54
53	52	51	50	49	48	47	46	45
44	43	42	41	40	39	38	37	36
35	34	33	32	31	30	29	28	27
26	25	24	23	22	21	20	19	18
17	16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1	0

4

Revised version Numbers 1 - 80



Original Version Numbers 0 - 80



Cat, Dog, & Mouse Magic Cards Version 2



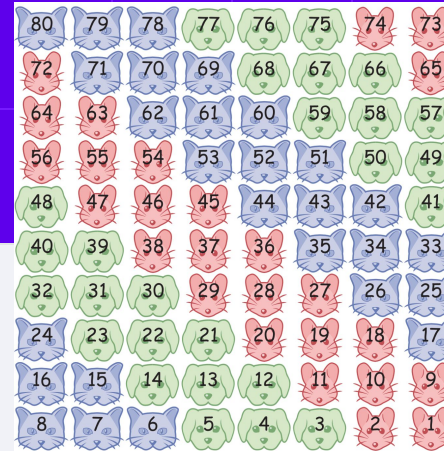
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72	71	70	69	68	67	66	65
64	63	62	61	60	59	58	57
56	55	54	53	52	51	50	49
48	47	46	45	44	43	42	41
40	39	38	37	36	35	34	33
32	31	30	29	28	27	26	25
24	23	22	21	20	19	18	17
16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1

1



80	79	78	77	76	75	74	73
72	71	70	69	68	67	66	65
64	63	62	61	60	59	58	57
56	55	54	53	52	51	50	49
48	47	46	45	44	43	42	41
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32	31	30	29	28	27	26	25
24	23	22	21	20	19	18	17
16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1

2



80	79	78	77	76	75	74	73
72	71	70	69	68	67	66	65
64	63	62	61	60	59	58	57
56	55	54	53	52	51	50	49
48	47	46	45	44	43	42	41
40	39	38	37	36	35	34	33
32	31	30	29	28	27	26	25
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16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1

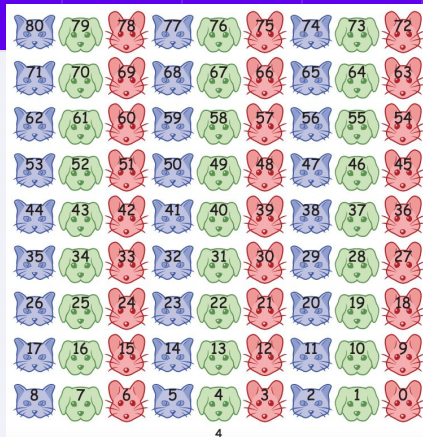
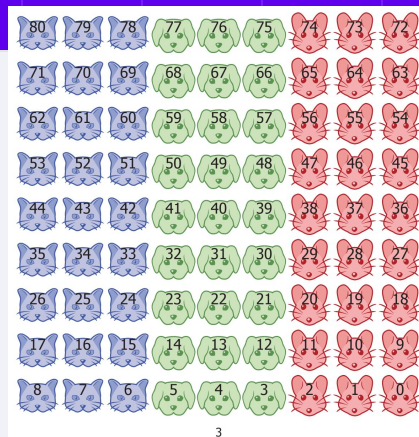
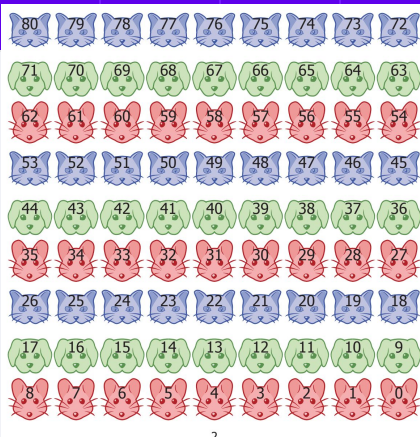
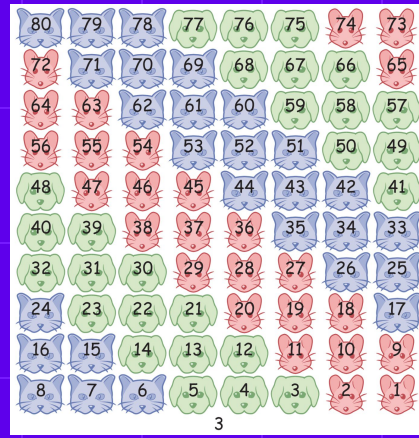
3



80	79	78	77	76	75	74	73
72	71	70	69	68	67	66	65
64	63	62	61	60	59	58	57
56	55	54	53	52	51	50	49
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32	31	30	29	28	27	26	25
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16	15	14	13	12	11	10	9
8	7	6	5	4	3	2	1

4

Which layout do you prefer?










Questions or comments

Nancy Blachman

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Method: Calculate the secret number as follows: Start off with the number 0 in your head. If Rowan specifies **blue** (cat ) , **green** (dog ) or **red** (mouse ) , find the smallest **blue** (cat) or **green** (dog) number on the card, and add that number to the sum in your head. Don't add anything if **red** (mouse) is specified. Repeat this procedure for the next three cards. After the 4th card, the sum is the secret number!

Example: Suppose the player chooses the number 42.

- On card 1, the number 42 is **green** (dog) and the smallest **green** (dog) on that card is 27. So start with 27 as the number in your head.
- On card 2, the number 42 is **green** (dog) and the smallest **green** (dog) number on card 2 is 9. So add 9 to the sum in your head to get 36.

Cat, Dog, & Mouse Magic

How does it work?

$$\begin{aligned} 326 &= 3 * 10^2 + 2 * 10^1 + 6 * 10^0 \\ &= 3 * 100 + 2 * 10 + 6 * 1 \\ &= 300 + 20 + 6 = 326 \end{aligned}$$

$$\begin{aligned} 42 &= 1 * 3^3 + 1 * 3^2 + 2 * 3^1 + 0 * 3^0 \\ &= 1(\text{dog}_{42}) * 27 + 1(\text{dog}_{42}) * 9 + 2(\text{cat}_{42}) * 3 + 0(\text{mouse}_{42}) \\ &= 27 + 9 + 6 = 36 + 6 = 42 \end{aligned}$$