

Mathematical Magic

By Nancy
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JRMF.org



Inspire Curiosity

How can you inspire
curiosity about
mathematics?

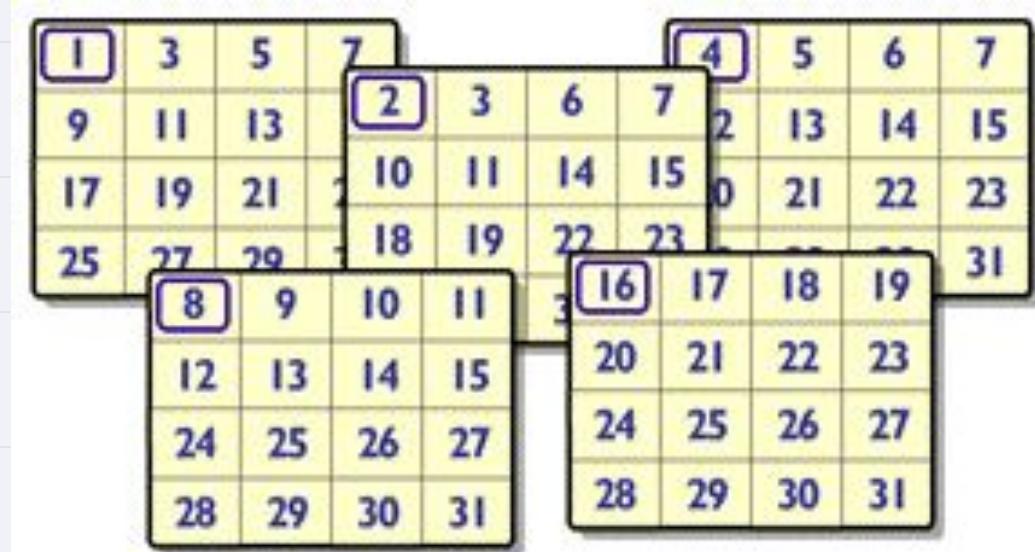
Make it enticing,
engaging, and fun.



@NancyBlachman
Cat, Dog, and Mouse Magic

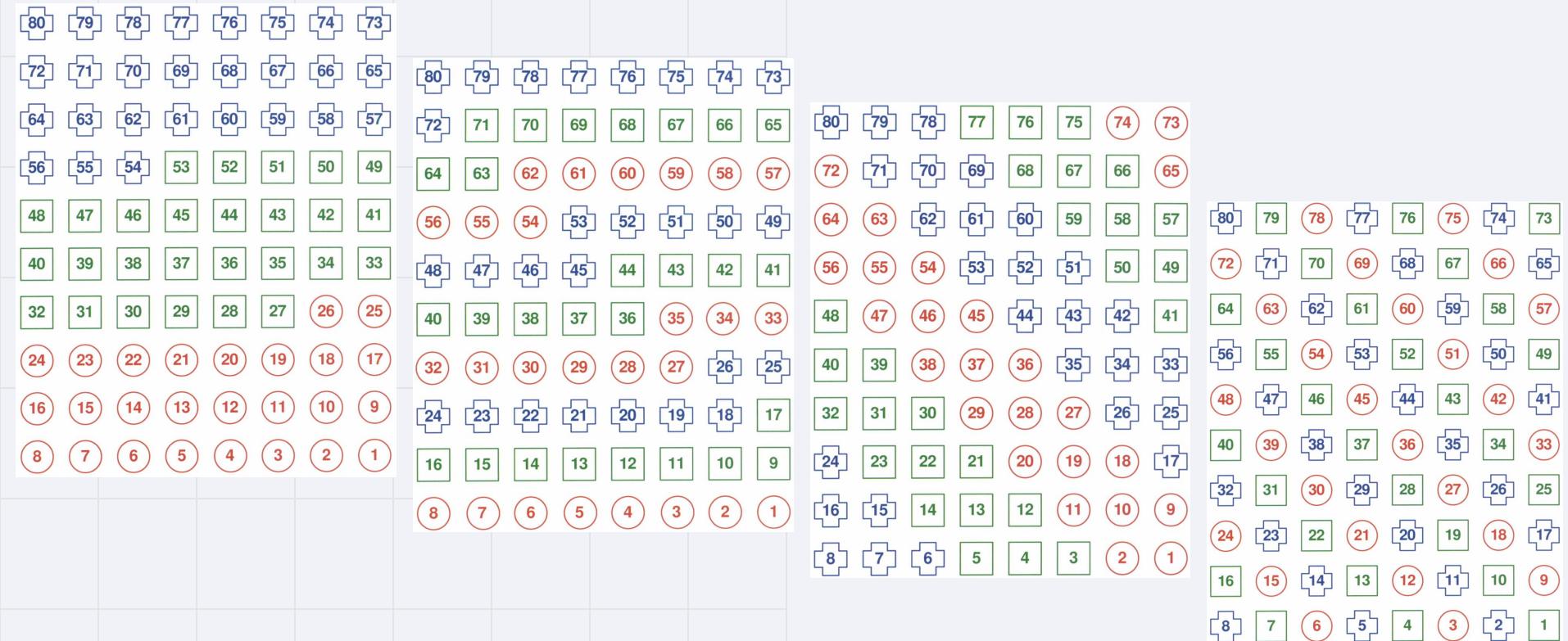
Guess the Number

When searching for activities, I found
Guess the Number Magic Trick.



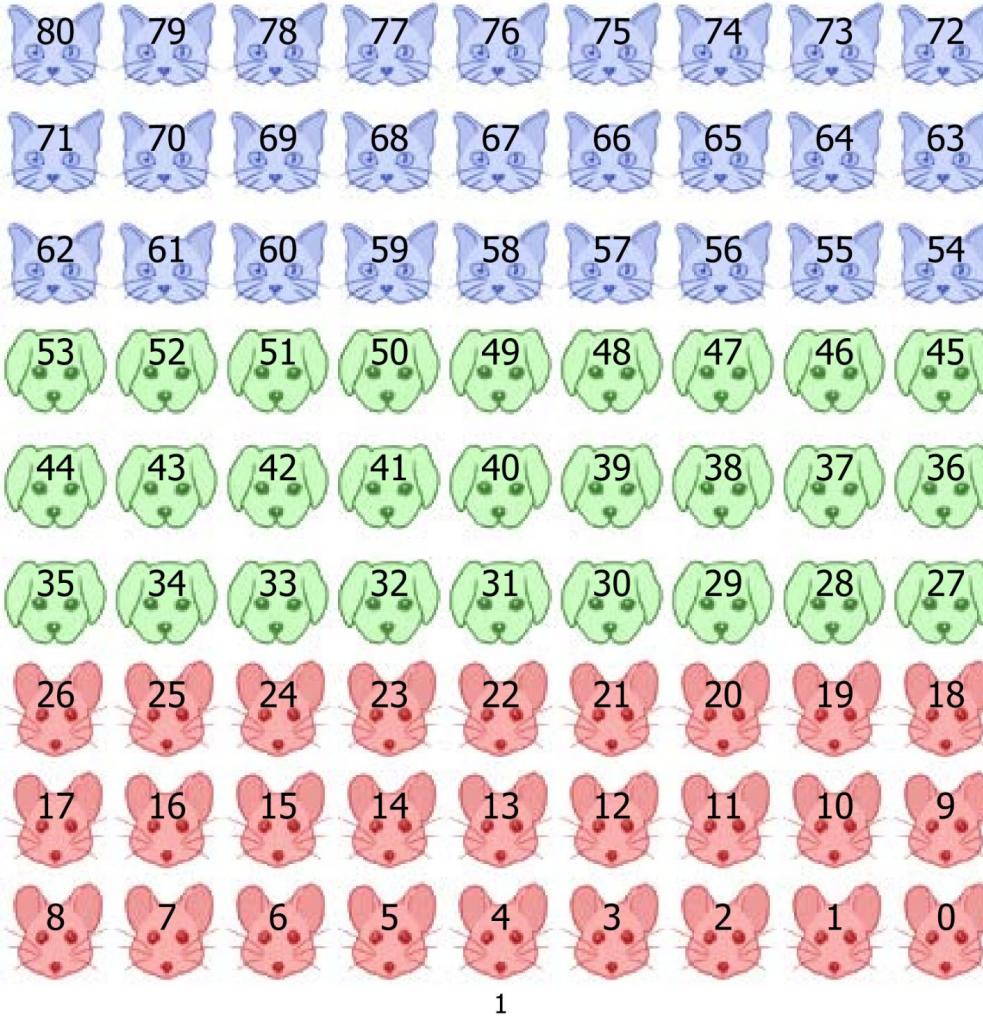
Magic: Add up the numbers in the left upper corners of the cards specified.

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

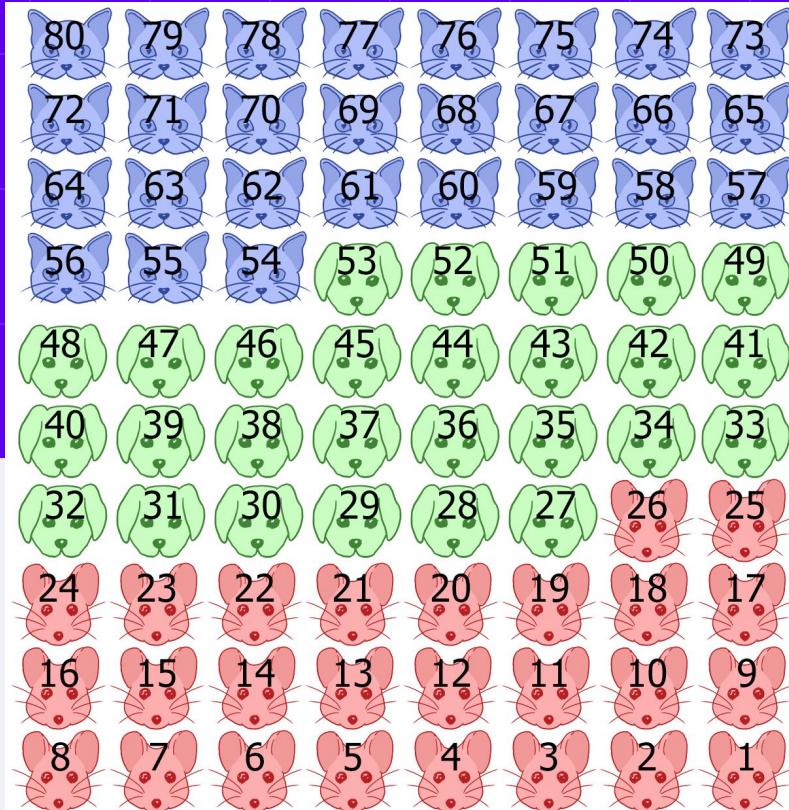
| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| 80 | 79 | 78 | 77 | 76 | 75 | 74 | 73 | 72 |
| 71 | 70 | 69 | 68 | 67 | 66 | 65 | 64 | 63 |
| 62 | 61 | 60 | 59 | 58 | 57 | 56 | 55 | 54 |
| 53 | 52 | 51 | 50 | 49 | 48 | 47 | 46 | 45 |
| 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 |
| 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 | | | | | | | | |

| | | | | | | | | |
|----|----|----|----|----|----|----|----|----|
| 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 |
| 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



1

Original Version Numbers 0 - 80



1

9

Cat, Dog, & Mouse Magic Cards

Version 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 |
| 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 |
| 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 |

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 |
| 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 |
| 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 |
| 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 |

4

Which layout do you prefer?

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| 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 |

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 |

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 |
| 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 |
| 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 |
| 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 |

4

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

1

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

2

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

3

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

4



A portrait of Nancy Blachman, a woman with short, wavy grey hair and blue-rimmed glasses, smiling. She is wearing a dark top with a colorful, floral or bird-themed patterned collar.

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?

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

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