

Guess The Numbers Game

Name: _____

Let's play a game: I hold the following four cards.

1	3	5	7
9	11	13	15

Card #0

2	3	6	7
10	11	14	15

Card #1

4	5	6	7
12	13	14	15

Card #2

8	9	10	11
12	13	14	15

Card #3

Here is how the game goes: You choose a number between 0 and 15. DO NOT tell me that number! I then show you the cards, one by one, and you tell me whether the chosen number is in that card or not. I can then guess your number!

Sample Game:

You chose the number 13. I then show you the cards, one by one:

1. On **Card#0**, you say **YES**.
2. On **Card#1**, you say **No**.
3. On **Card#2**, you say **YES**.
4. On **Card#3**, you say **YES**.

Now I can guess : Your number is



Question 1: How did I do this ?!?

Question 2: Can you make a game like this for 'choose a number between 0 and 31'?

Question 3: If you can draw the numbers in two colors, 'red' and 'blue', and the answers are 'No', 'Red', 'Blue' : Can you make the game? With fewer cards? How?!?

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Explanation:

0 = 0000	;	4 = 0100	;	8 = 1000	;	12 = 1100
1 = 0001	;	5 = 0101	;	9 = 1001	;	13 = 1101
2 = 0010	;	6 = 0110	;	10 = 1010	;	14 = 1110
3 = 0011	;	7 = 0111	;	11 = 1011	;	15 = 1111

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Extension: Can we make it with base '3' rather than base '2'? Why not? What's special about base 2.

If we used two colors on a card, and you should have say 'no', 'red or 'blue'.