

Math Magic: The Mystery of the Magic Cards

Issue #4: A fun game which can work at many levels... (grades 4-12)

[An Index of All Math Magic Activities](#)

A COOL TRICK WHICH EMPOWERS STUDENTS TO BE A MAGICIAN, PRACTICES MENTAL ADDITION FACTS, ALLOWS FOR INDIVIDUAL DISCOVERY, AND HELPS PROBLEM SOLVING

A	B	C	D	E
16 17 18 19	8 9 10 11	4 5 6 7	2 3 6 7	1 3 5 7
20 21 22 23	12 13 14 15	12 13 14 15	10 11 14 15	9 11 13 15
24 25 26 27	24 25 26 27	20 21 22 23	18 19 22 23	17 19 21 23
28 29 30 31	28 29 30 31	28 29 30 31	26 27 30 31	25 27 29 31

PREP: To work with a large group copy each of the cards above on 12 x 18 construction paper to be taped to a whiteboard or other viewing surfaced. For smaller groups, smaller cards will work.

SUGGESTIONS FOR DOING THIS TRICK FOR THE MAXIMUM LEARNING EXPERIENCE:

1. Before you start, ANNOUNCE TO THE AUDIENCE: "If anyone knows this trick, **do not shout it out**. Check with the Magician, and he/she will test you, to let you be the magician for a few rounds."
2. Ask for a Volunteer to choose one number from the card above, write it on a piece of paper, and shared it with the others but not the Magician.
3. Then he or she will tell the Magician what A,B,C,D,E cards the number appears. The magician will quickly but secretly add the top left-most number in the cards identified.

Examples: 1) If the volunteer says the number appears only on cards C and E, the Magician knows the left-most number in C is 4, and in E is 1, so $4 + 1 = 5$, which is the secret number revealed. 2) Cards A, B, and D mean adding numbers $16+8+2$ mentally to get 26.

4. Repeat step 3-5 times verbally, but then emphasize the importance of making a list of the data (functions) you have discovered. Lastly, give a hint that the solution has something to do with the left-most number in the chosen cards. REMIND students not to shout out what is happening. As more and more see what's happening by a show of hands, have those who "get it" pair off with friends who they will lead but not tell, to the rule.

5. After that we can discuss as a class quick ways of adding the chosen left-most numbers. Hints: a) know ahead of time if all cards are chosen, the number is 31. b) determine if it's easier to add smaller to larger numbers $1+2+8$ first, or $8+2+1$, and so on. Then practice either with the group, or in small groups.

6. Lastly, I would challenge people as part of their homework assignment to try this trick on a family member, especially an adult, and see if you can help them discover the rule without telling them.

NOTES: a) pre-algebra students can have terms of commutative, associative principles of addition, b) lists generation a pattern leading to a Rule, algebra1, a determining a function $f(x)$. c) nice lead into computer counting systems (base-two or binary), other bases, and a greater understanding of our decimal system.