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Teacher: Ask a student to choose a natural number in the 1-31 range.

Then ask the student whether their number is on each of the five cards.

For any card to which they say “yes”, notice the number in the top left of the card and add those numbers to get the student’s number.

For example if their number is 7, they will say yes to the cards with a 4 and a 2 and a 1 in the top left. Add $4 + 2 + 1$ to get their number.

If they choose the number 23, they will say yes to the cards with a 16, a 4, a 2, and a 1 in the top left. Add $16 + 4 + 2 + 1$ to get their number.

This is sure to amaze your students, and it works because of the binary numbers (base two)/geometric sequence with common ratio 2.

Enjoy!

-Dr. Clement