Two Sides To The Story

Preparation: Cut out 5 small sheets of paper or cut three 3 by 5 note cards in half, Write 1 on one side of a paper and 4 on the other. Write 3 on one side of a paper and 6 on the other. Write 5 on one side of a paper and 8 on the other. Write 7 on one side of a paper and 10 on the other. Write 9 on one side of a paper and 12 on the other. Be sure to underline the 6 and 9 so no confusion can occur.



- Step 1. Ask a student to shuffle the sheets of paper and turn them over as many times as they like. While they do this you turn your back to the student or move to the back of the class so that you cannot possibly see the cards.
- Step 1. When they feel the cards are mixed up enough ask the student to put the 5 pieces of paper on the desk in any order they want with whatever sides facing up they like.
- Step 2. Have them add the 5 numbers that are facing up.
- Step 3. Ask the student how many of the numbers facing up are EVEN.
- Step 4. Multiply the number of EVENs facing up by 3. Add that number to 25 to find the sum of the 5 numbers facing up and announce the total. Turn around to see that you are correct.

Example using the even clue:

The student places 4, 3, 8, 10, 12 on the desk and says there are 4 even number facing up. The total is $25 + 4^*3 = 37$ and 4 + 3 + 8 + 10 + 12 = 37

The student places 1, 3, 5, 10, 12 on the desk and says there are 2 even number facing up. The total is $25 + 2^*3 = 31$ and 1 + 3 + 5 + 10 + 12 = 31

Note: You can ask how many ODDs are facing up. Multiply the number ODDs facing up by 3. Subtract that number from 40 to find the sum of and the total will be 40 - 3 *number of odds.

Example using the odd clue:

The student places 1, 3, 5, 10, 12 on the desk and says there are 3 odd numbers facing up. The total is $40 - 3^*3 = 31$ and 1 + 3 + 5 + 10 + 12 = 31

How does it work.

There are 3 key concepts that are the foundation to seeing how it works.

1. If you add an odd number to any odd number you get an even number. In the trick on the last page I added 3 to every odd front to get an even number on the back. Each card has a number on its back that is 3 larger than the front. Each time you turn a card with an odd number over the new number is 3 larger so the total is 3 more than the original total



- **2.** Since every odd face has an even number on its back the number of evens showing tells you the number of cards that were turned over.
- **3.** The total of the 5 odd numbers I picked is 25. If all 5 odd numbers are face up there are 0 evens face up and the total will be 25. Each time an even card is turned over that card has a number 3 larger then the odd side and the total gets 3 larger. If you know the number of even cards showing you know the new total is 25 plus 3 more for every even that is showing.

Total of the 5 cards = 25 + 3 times the number of even cards showing.

OR

You could also think of the cards as all evens facing up with a total of 40. The number of odd cards facing up tells you the number of cards that were turned over. If you turn over an even card the odd number on the back is 3 less that the even number. This makes the total decrease by 3 for each odd card showing.

Total of the 5 cards = 40 - 3 times the number of odd cards showing.

How can I make my own numbers

- 1. You can use any number of cards. It works best to have several but too many just gets boring.
- 2. Put a different odd number on each card and find the total of the odds.
- 3. Add a small odd number (let say the number is x) to each of the odd numbers and put the even number you get on the corresponding opposite side. Find the total of the even.

Total of the cards = odd total + x times the number of even cards showing.

Total of the cards = even total -x times the number of odd cards showing.