The trick is not over. We continue similarly with the set of twelve cards. Cut several times and count out six cards face down placed down next to the other stack of six. This time we spell the five words EVERY PAIR, FINALLY, SHALL AGREE.

Once again remove the top cards in each of the two stacks after randomly spelling each of the five words. Of course the last pair will turn out to be matched letters. In fact every pair in both the BROAD set and RIPPLE set can now be shown to match!

How does the trick work? Most of the students were familiar with modular arithmetic and could understand the working principle involved. First the repeated cutting does not change the order in either set. The counting out reversal of half the cards in each of the two sets arms the trick. For BROAD, we choose four words of varying length so that the number of letters in the first word \( \equiv 4 \mod 5 \), in the second \( \equiv 3 \mod 4 \), in the third \( \equiv 2 \mod 3 \), and in the fourth \( \equiv 1 \mod 2 \). Notice that the four words LAST TWO CARDS MATCH meet this requirement. For the six letter RIPPLE double set we start with a first word (here EVERY) whose length \( \equiv 5 \mod 6 \) and continue down the modular path.

A POEM

MARTIN GARDNER
Norman, Oklahoma

This is an excerpt from Gardner's 1969 book *Never Make Fun Of A Turtle, My Son* (Simon and Schuster, illustrated by John Alcorn).

**Autumn**

A smoky smell comes drifting  
Through the window, and a breeze  
Softly taps your nose and whispers,  
"My dear Thomas, if you please . . .

Kindly close that book you're reading,  
On a day like this? For shame!  
When the woods and hills are blazing  
With a crimson-yellow flame."

Leaves are falling, dancing, swirling,  
Piling high along the street.  
Leaves that scatter when you kick them,  
Leaves that crunch beneath your feet.

Come outside, the breeze is calling,  
Come outside, my boy, and play  
In the gusty golden splendor  
Of a hazy autumn day.