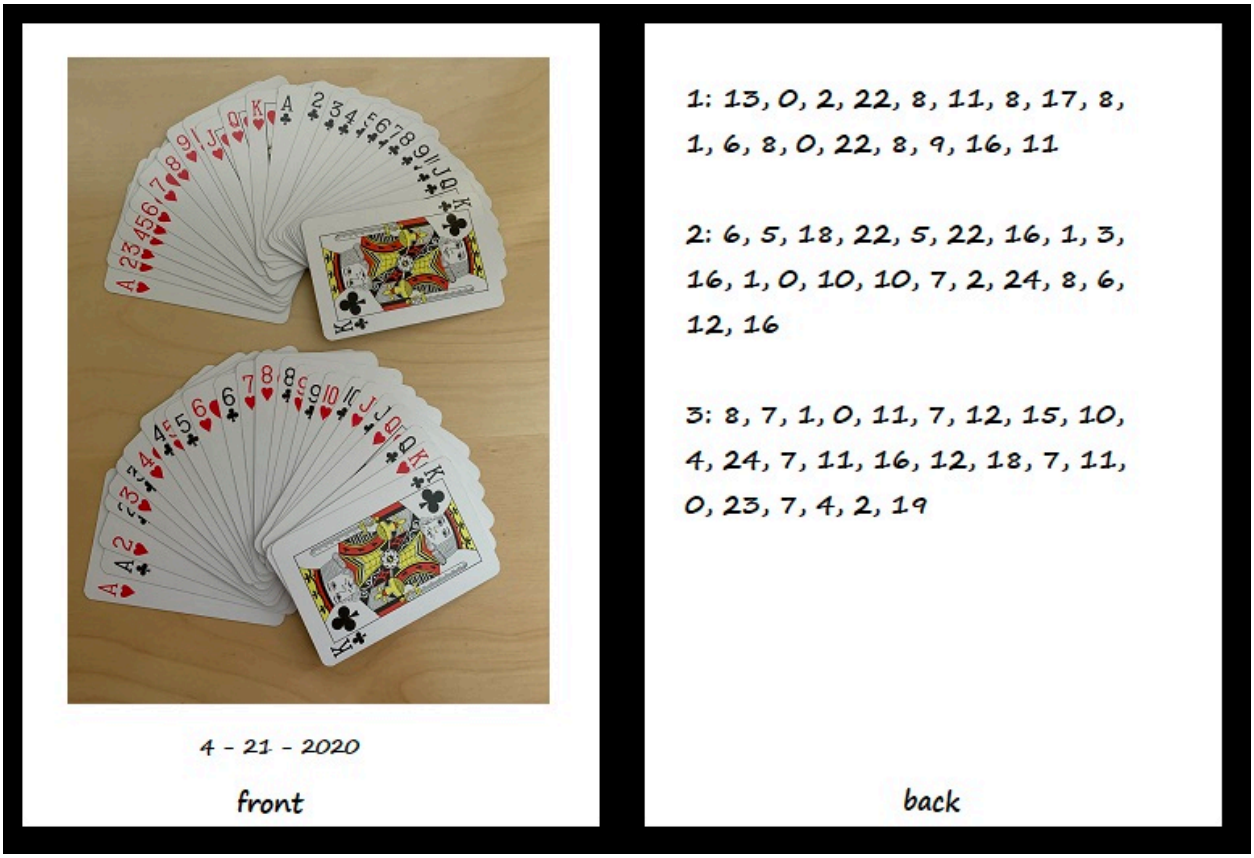
Challenge 2:

The key to decrypting lies in the clue given by the picture of the cards:



The picture of the cards shows a “before” and “after” of a hand of cards where the cards have been perfectly interleaved after being cut in half (perfectly shuffled). Note there happen to be 26 cards which might (and does) correspond to the 26 letters in the alphabet.

The ciphertext however is given in numbers. If we assign numbers to the letters and apply the same permutation, this might give us a way to decipher the code.

This all suggests the following correspondence.

Pos. No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
original order	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
order after shuffle	A	N	B	O	C	P	D	Q	E	R	F	S	G	T	H	U	I	V	J	W	K	X	L	Y	M	Z

We use this to decipher the first part of the message (starting after the 1):

13	0	2	22	8	11	8	17	8	1	6	8	0	22	8	9	16	11
t	a	b	l	e	s	e	v	e	n	d	e	a	l	e	r	i	s

If we keep using this scheme to get the second part of the message (starting with 2) then it doesn't make sense. It turns out the "2" represents a message after a second "shuffle" and the "3" message requires a third shuffle:

Pos. No.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
original order	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
order after 1 shuffle	A	N	B	O	C	P	D	Q	E	R	F	S	G	T	H	U	I	V	J	W	K	X	L	Y	M	Z
order after 2 shuffles	A	T	N	H	B	U	O	I	C	V	P	J	D	W	Q	K	E	X	R	L	F	Y	S	M	G	Z
order after 3 shuffles	A	W	T	Q	N	K	H	E	B	X	U	R	O	L	I	F	C	Y	V	S	P	M	J	G	D	Z

Continuing with the decryption we get

2: ours use the tapping code

3: beware of undercover agents

Putting it all together we get:

Table seven dealer is ours. Use the tapping code. Beware of undercover agents.

Note: To those familiar with modular arithmetic, the position number of a letter after a shuffle can be found by $s_1(x) = 2x \ (mod\ 25)$. For example, the "R" in position 17 to start is in position $2 \cdot 17 \ = \ 34 \ = \ 9 \ mod\ 25$ after one shuffle. After 2 shuffles a card is in position $s_2(x) = 2^2 \ x \ (mod\ 25)$ and after 3 $s_3(x) = 2^3 \ x \ (mod\ 25)$. This can be used to quickly decipher by using the fact that $2 \cdot 13 \ = \ 1 \ (mod\ 25)$.