Advanced Mathematics
Support Programme®

Reading Minds…

Mind Reading Trick

- This trick enables you to look like you're reading someone's mind…

  - Watch <u>this</u> video

How it works

It will help if you have a pack of cards to help, or you can make your own!

In a normal pack of cards, choose the same numbers (from different suits).

If you make your own set of cards, you will need two of each picture – the more different the better!

Thinking about the trick

- What did you notice about the number of counters being used?

- Do you think it mattered where the counters were placed?

- Do you think it matters how many counters were being placed?

Unpicking the trick

Trying the trick with the cards face up may help you answer these questions and analyse the mechanics of why the trick works.

- It might help to work backwards

Unpicking the trick (hint)

Trying the trick with the cards face up may help you answer these questions and analyse the mechanics of why the trick works.

- Start with a pair of cards
- Add another pair on top
- Do one swap (remember to move the card from bottom to top)
- Add another pair on top and do two swaps
- 'Undeal' one pile and put them on top of the other pile

■ What do you notice about the order of the cards?
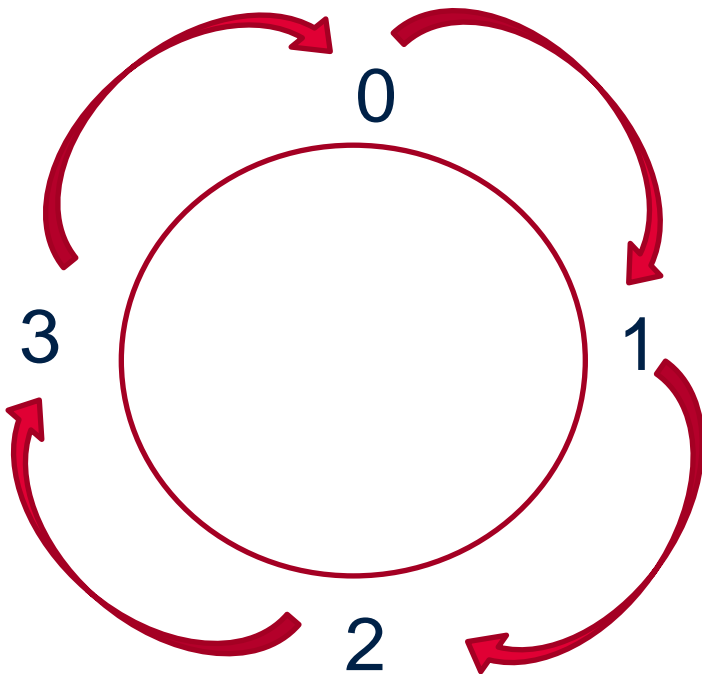
Unpicking the trick

- Can you use different amounts of counters (swaps) and get the same result?
  - Does how you choose to set up the cards matter?
  - Can you shuffle them?
  - Do you have to cut them in a certain place?
  - Does the order matter?

Unpicking the trick

- Start with 4 pairs.

- How many counters can you start with in which piles?

- Can you create the trick straight away?

Modulo arithmetic

- The trick works on modulo arithmetic. Modulo arithmetic is also called clock arithmetic, and is best understood by a diagram such as this

This is a modulo four, or Mod 4 diagram. Use the diagram to show that

- 6 Mod 4 = 2

- 11 Mod 4 = 3

- 8 Mod 4 = 0

Unpicking the trick

- Now you should be able to change the trick.

- The trick is based on clock arithmetic.

- After completing the trick, can you fill in this table

Number of cards	Number of counters
8	
7	
6	
5	
4	
3	
2	

Extending the trick

- Martin Gardner (an amazing recreational mathematician) presented this trick using the number of letters in each words of the phrase 'last two cards match' so the first swaps would have 4 swaps, then 3, then 5, then 5.

- Can you explain how this works?

- Can you make your own phrase? You don't have to start with 10 cards, you could start with 8, or 12, or even the whole deck!

Other Activities

- You may want to try other card tricks or activities:

amsp.org.uk/resource/maths-club-activities

Contact the AMSP

📞 01225 716 492

@ *admin @amsp.org.uk*

🖱 *amsp.org.uk*

🐦 Advanced_Maths