Advanced Mathematics Support Programme®

Mind Reading Trick

- This trick enables you to look like you're reading someone's mind
  - Watch this video *or*
  - Watch your teacher *or*
  - Watch two students demonstrating it to each other *or*
  - Have many students demonstrate things to each other

How it works

Unpicking 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

- Start with 3 pairs of cards.
- How many counters will you need?
- Can you use different amounts of counters 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?

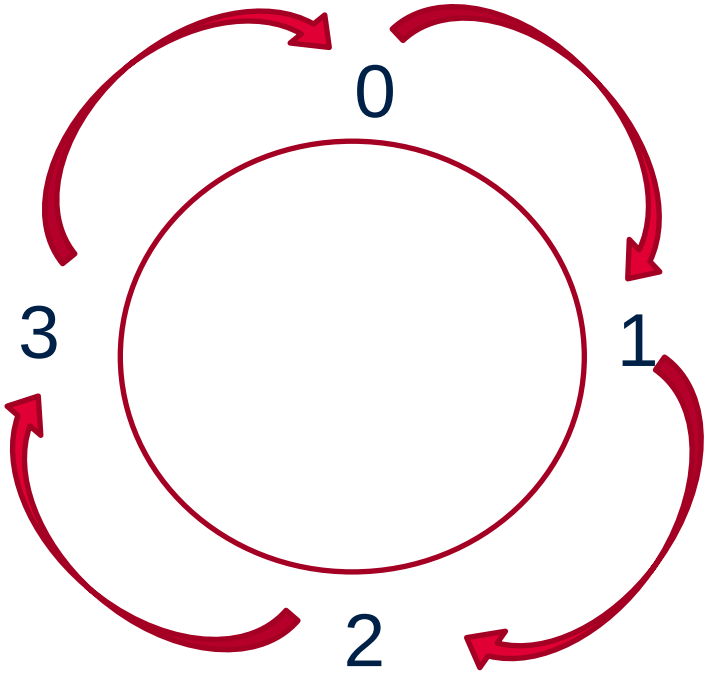
(You may want to do the trick with the cards face up to examine the mechanics of the trick)

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 coins
8	
7	
6	
5	
4	
3	
2	

Extending the trick

- Martin Gardner (an amazing recreational mathematician) presented this trick using 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!

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