

# Edinburgh MathsJam



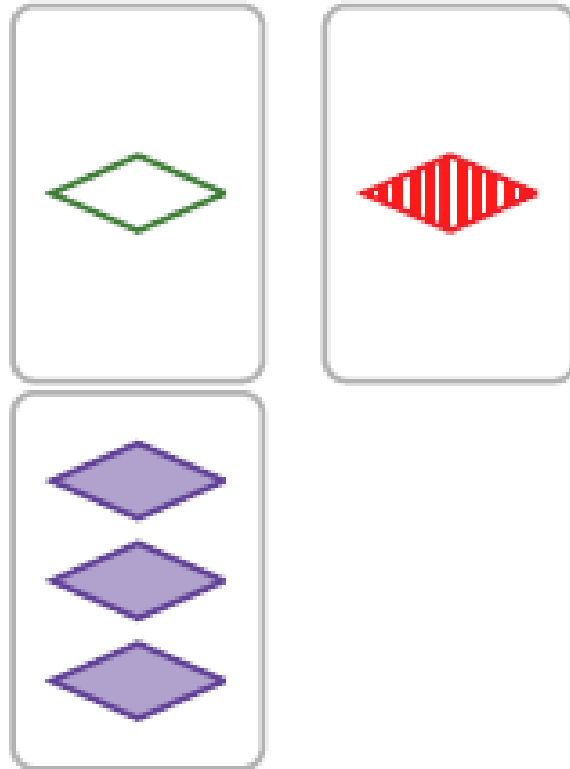
# Magic SET Square

By Professor Hamish McSporry  
(Edinburgh MathsJam Mathscot)

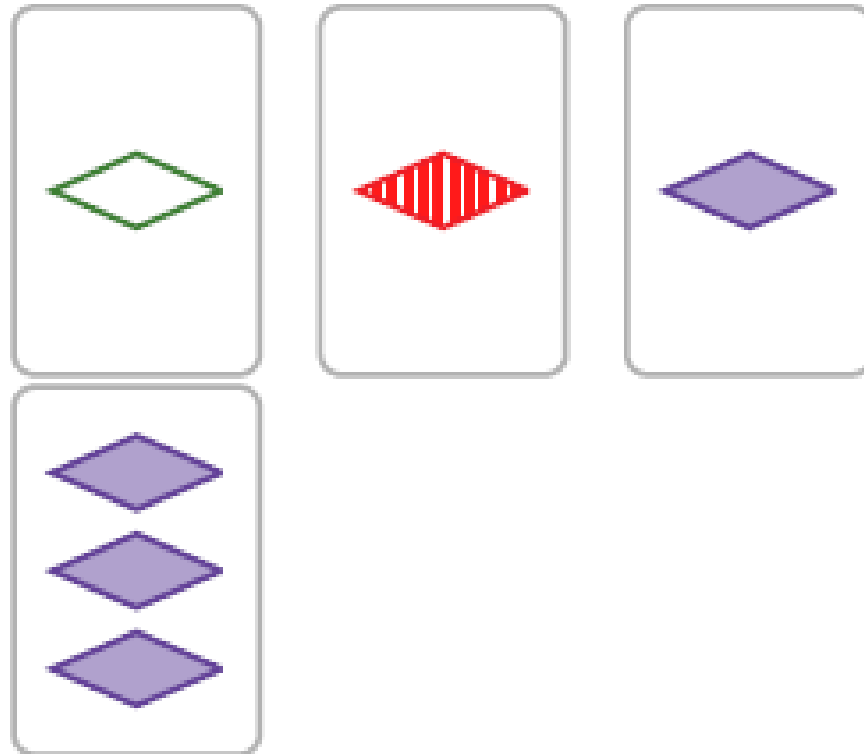
Hamish likes to hide a card –  
we have to guess the card at the end!



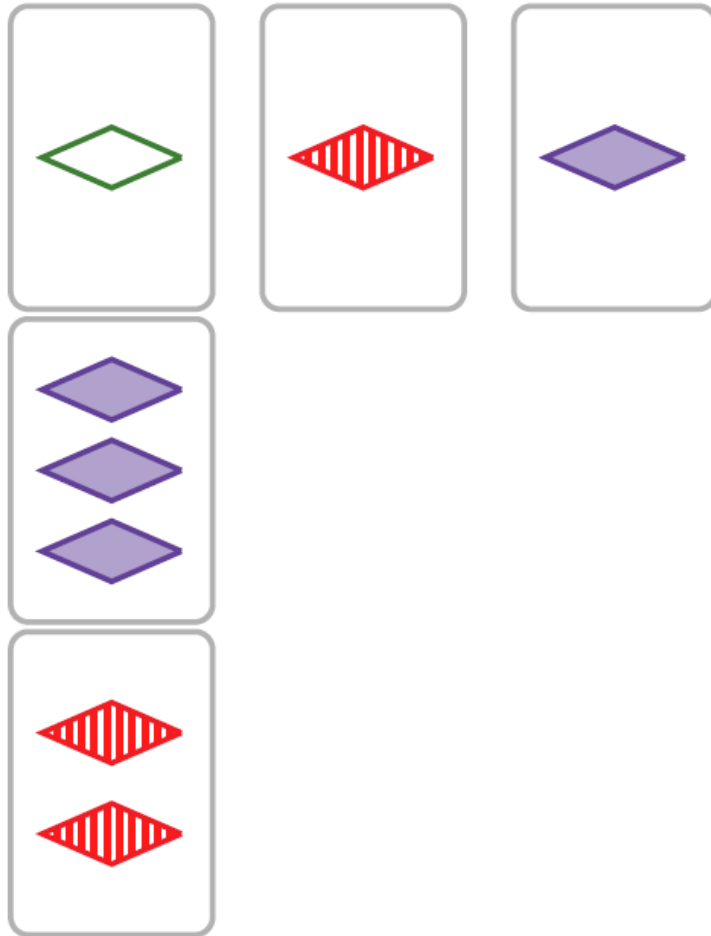
# Three cards that don't make a SET



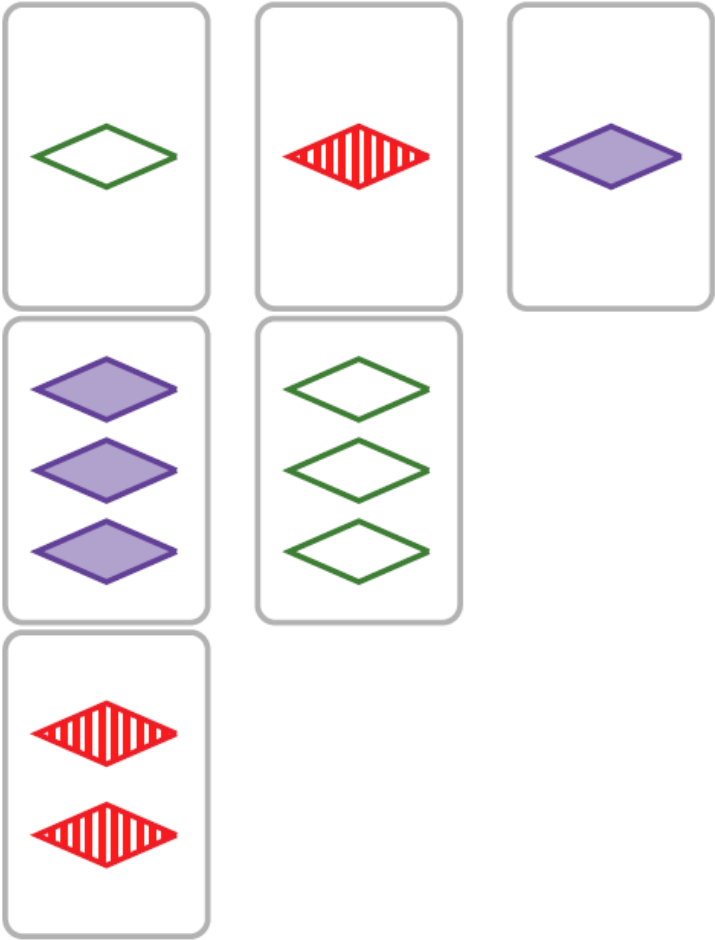
Add the card that makes the  
top row a SET



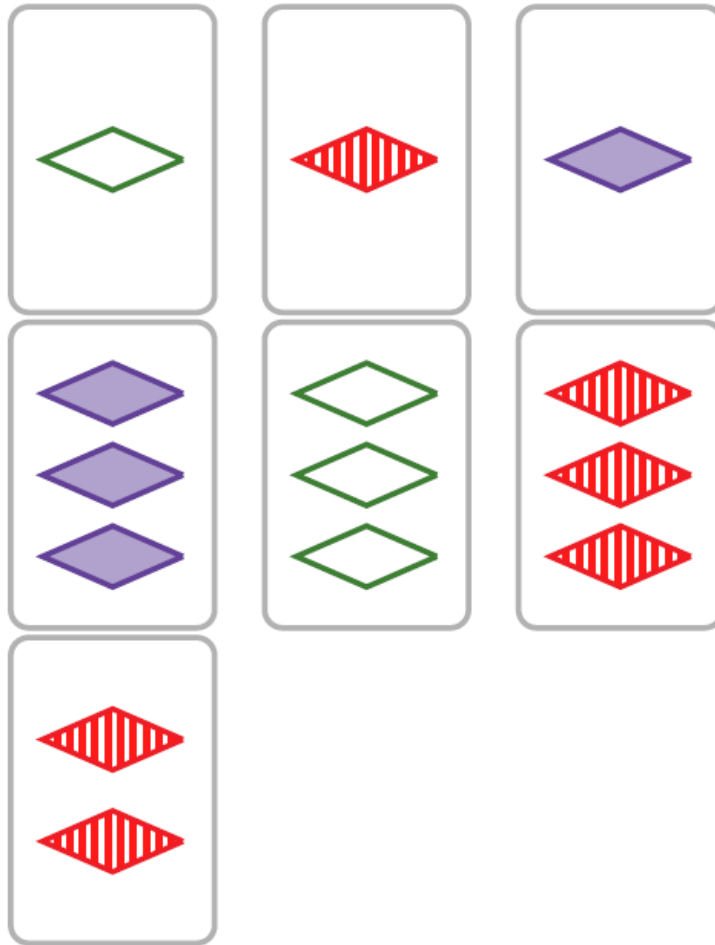
Add the card that makes the first column a SET



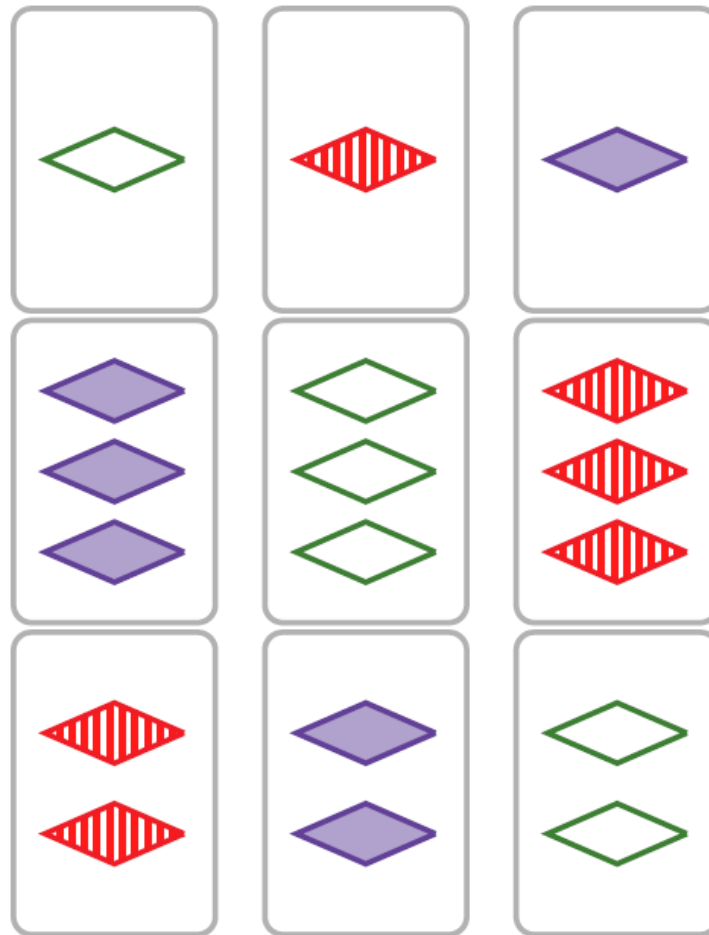
Add the card that makes the diagonal  
(bottom left to top right) a SET



Add the card that makes the  
middle row a SET

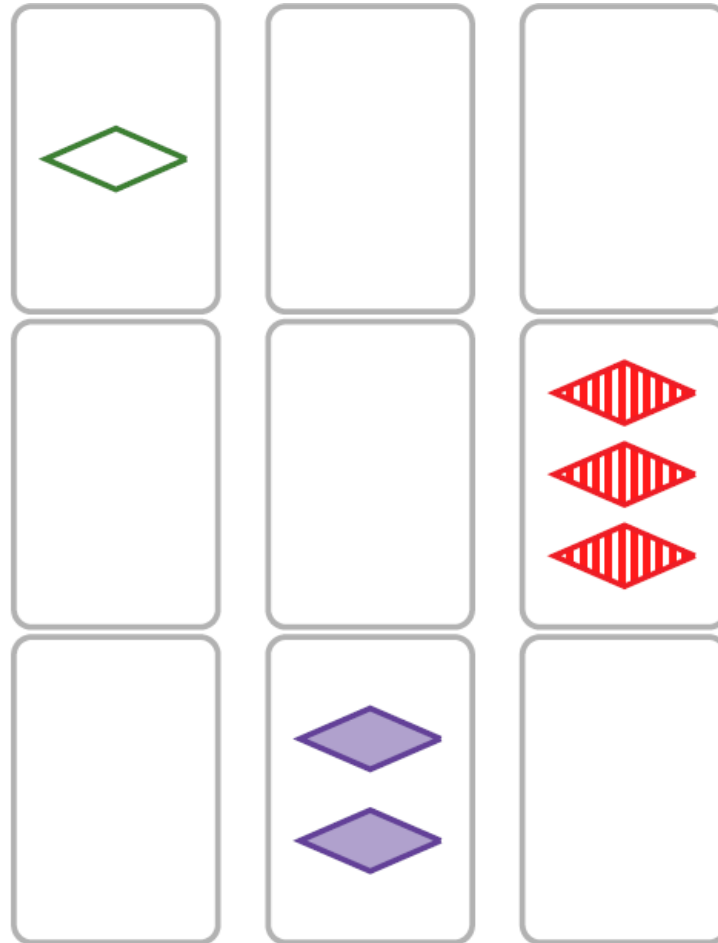


Add the cards that makes the middle and right-hand columns SETs

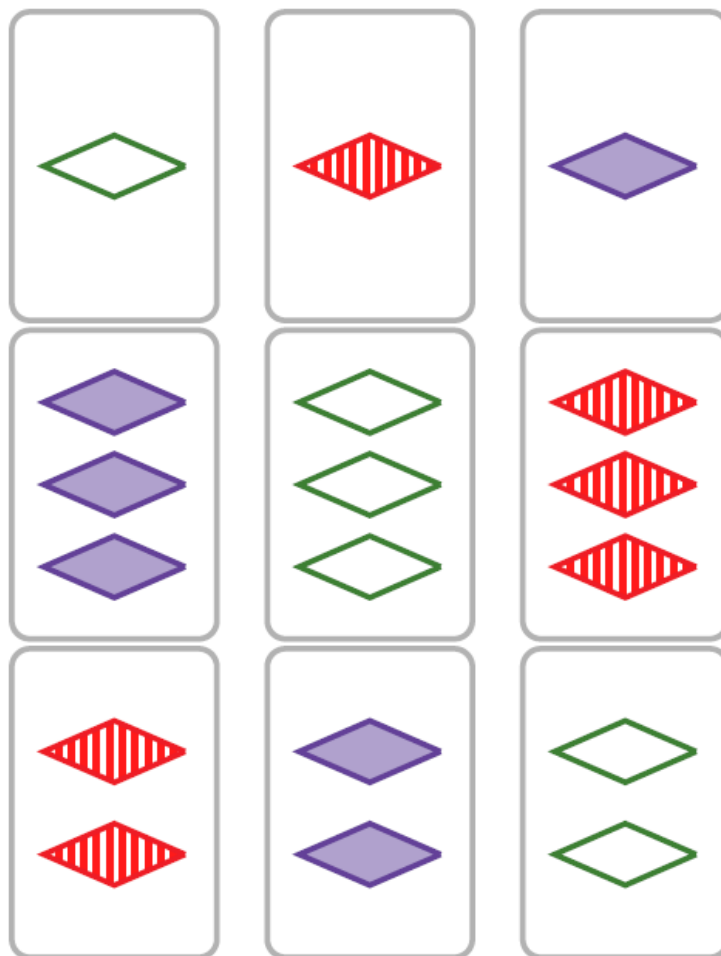


There are actually 12 SETs.

Three rows, three columns, two diagonals  
and ...



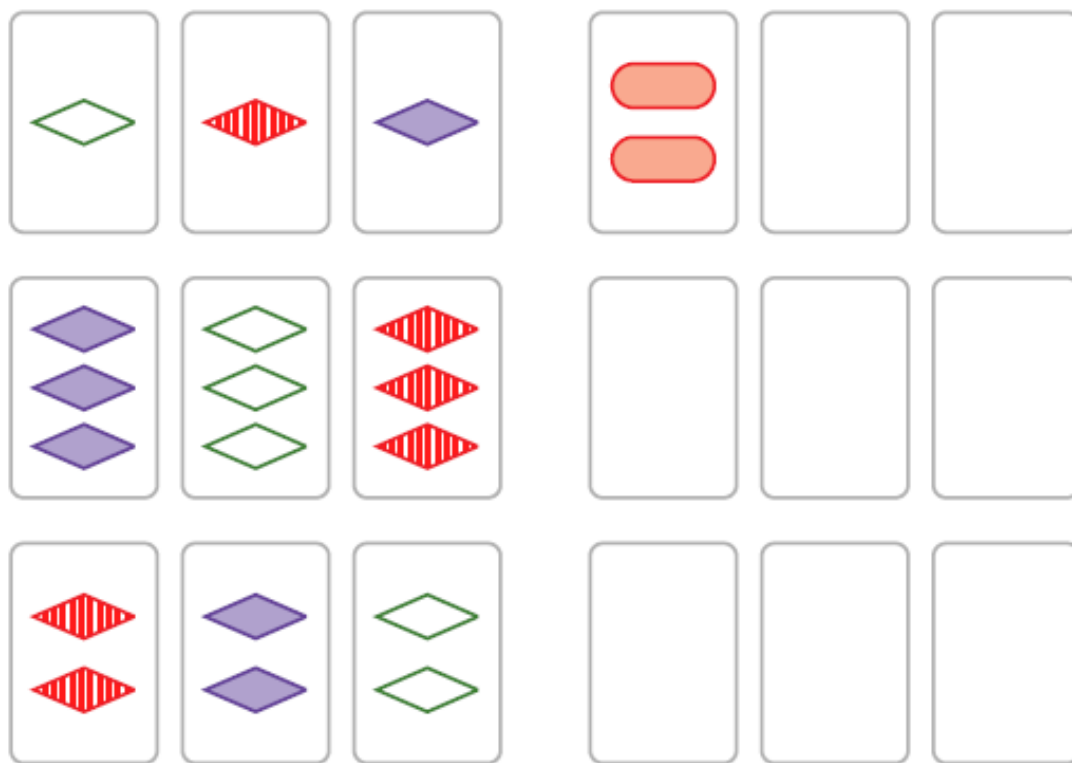
# Now consider cyclic groups



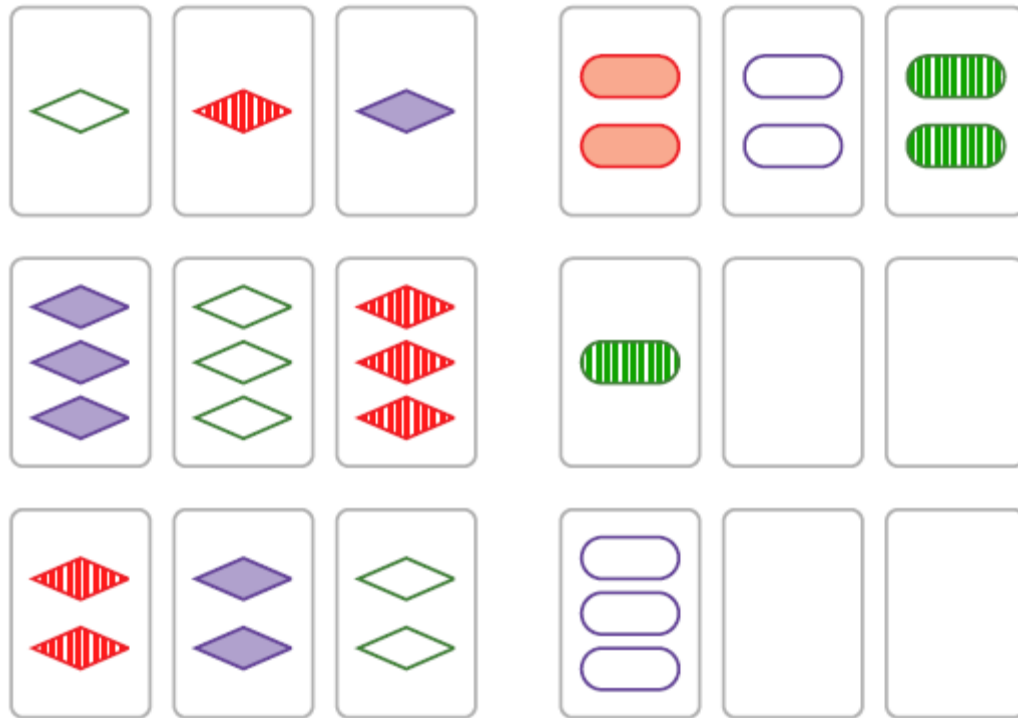
# So you could construct the SET square just using the cycles.

- Horizontal:
  - i. All the same number
  - ii. Empty ... Striped ... Solid
  - iii. Green ... Red ... Purple
  - iv. Diamonds ... Ovals ... Squiggles
- Vertical:
  - i. One ... Three ... Two
  - ii. Empty ... Solid ... Striped
  - iii. Green ... Purple ... Red
  - iv. All the same shape

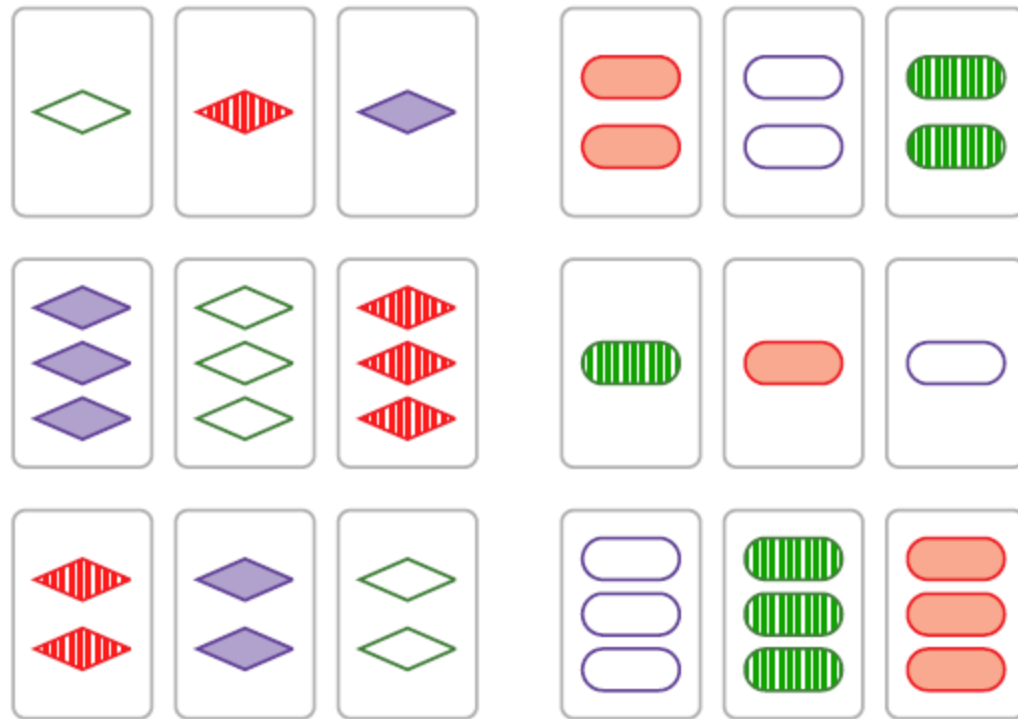
Choose a new card to be the top left-hand corner of a new SET square



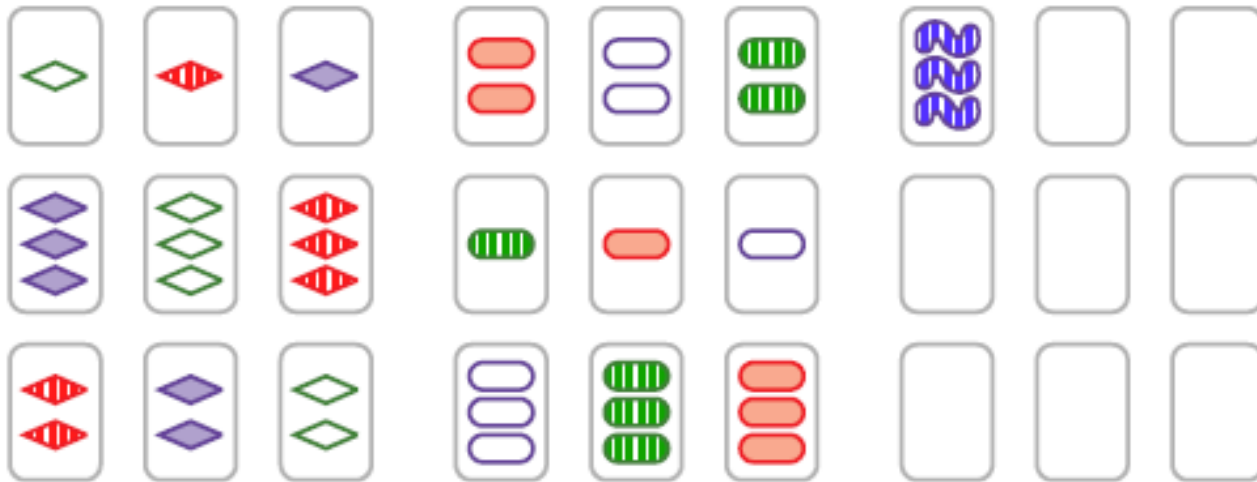
Just follow the cycles to get ..



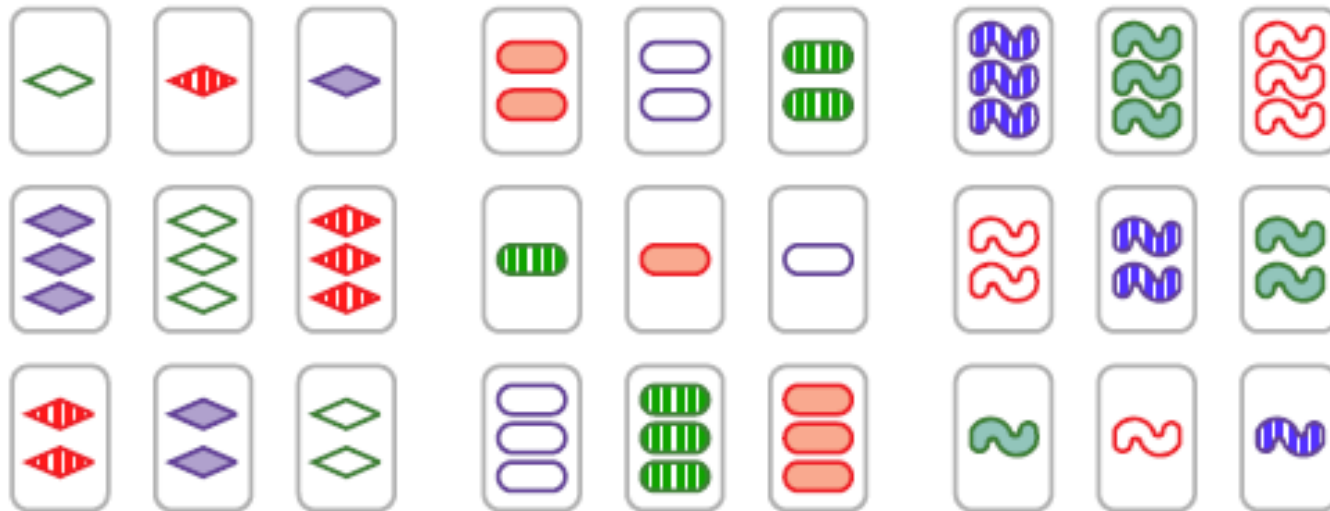
# Use cycles or SETs to complete



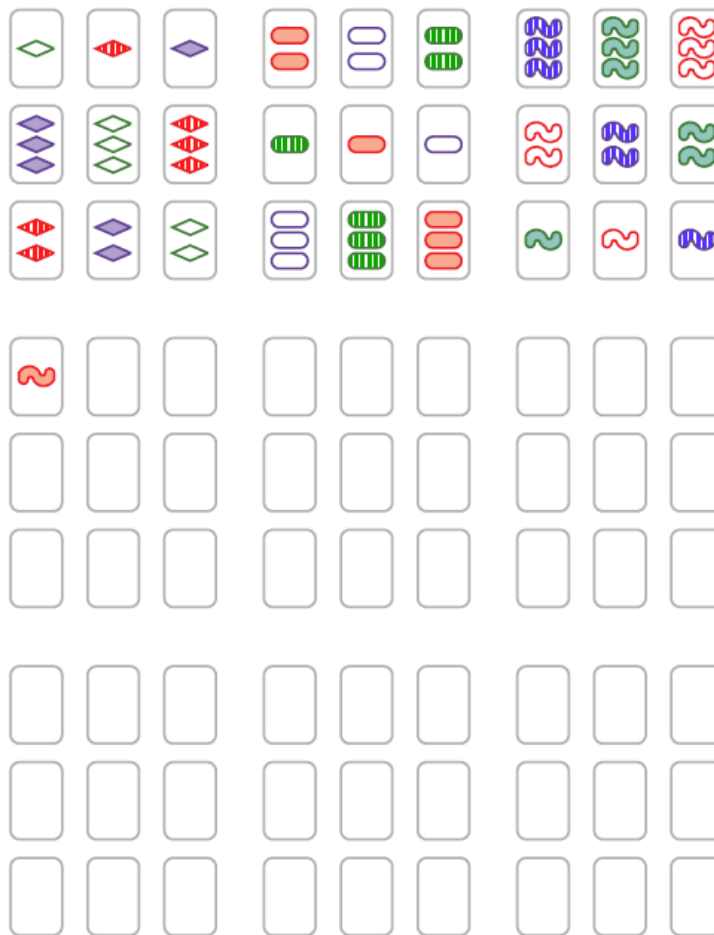
Using the top left-hand cards you can see  
which card is needed to make a SET



Now complete this SET square  
 (use whatever method you prefer)



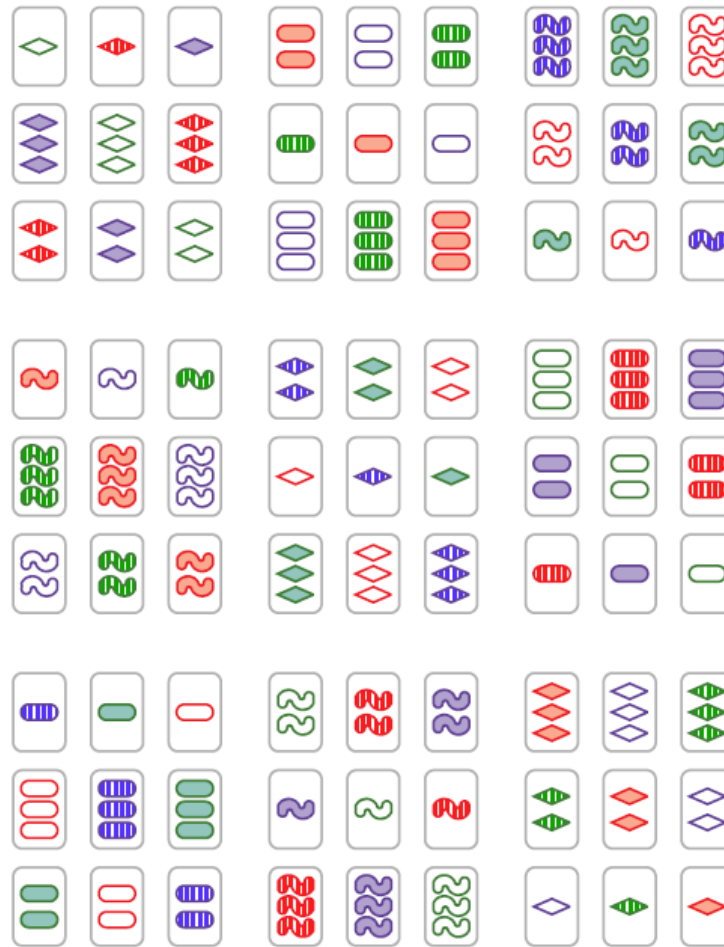
Choose a new card to be the top left-hand card for the next row





# Complete the bottom left-hand SET square as before for the top-right


You can now complete the rest of the SET squares



# Every card in the pack is used !

