SET

Three cards form a set if each of the following hold true:

(1) all cards have the same shape   **OR**   all cards have different shapes,

(2) all cards have the same color   **OR**   all cards have different colors,

(3) all cards have the same number   **OR**   all cards have different numbers,

(4) all cards have the same shading   **OR**   all cards have different shading.

Exercise 1 Of the following collections of three cards, precisely two are sets. Which ones?
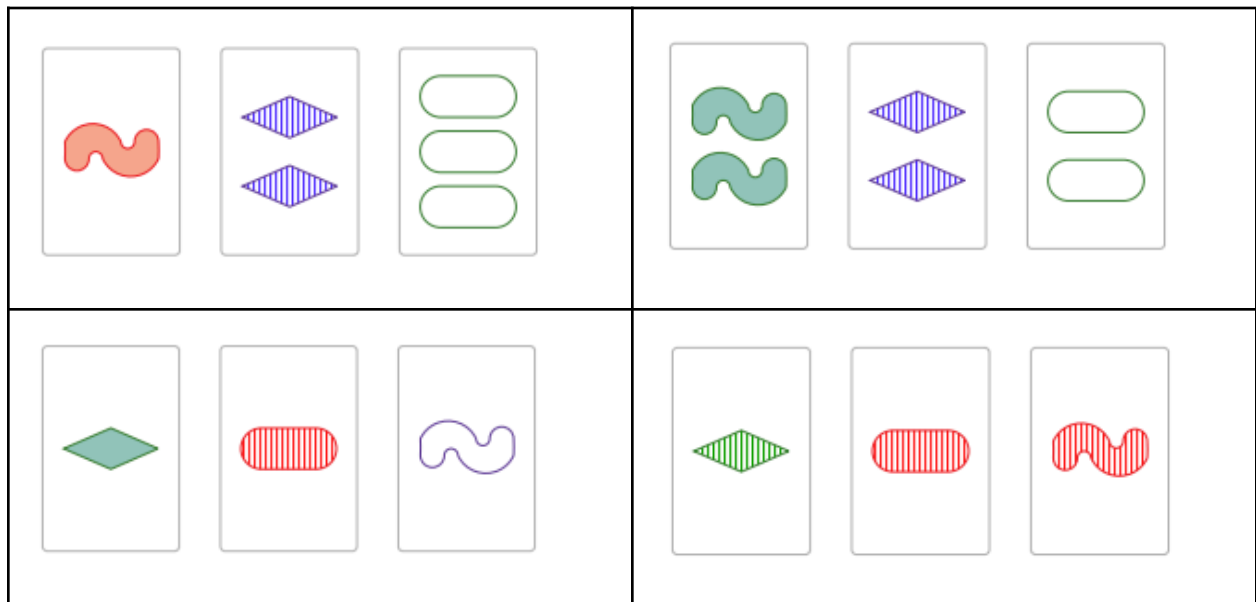

Exercise 2 Play a few games of Set!

Exercise 3 Each combination of shape, colour, number and shading appears exactly once in a Set deck. How many cards are there?

Exercise 4 If you draw two cards from the Set deck, how many cards remain in the deck such that they form a Set with the first two cards?

Exercise 5 If you randomly draw three cards from the Set deck what is the probability they form at Set?

Exercise 6 How many different Sets are there in the deck?

The game of Set begins with 12 cards being placed on the table, however, it is possible for there to be *no* **Sets** amongst the 12 cards. For example, the 12 cards laid out below contain no **Sets**:

Green	Red	Green	Purple
Red	Green	Gren	Red
Red	Purple	Red	Green
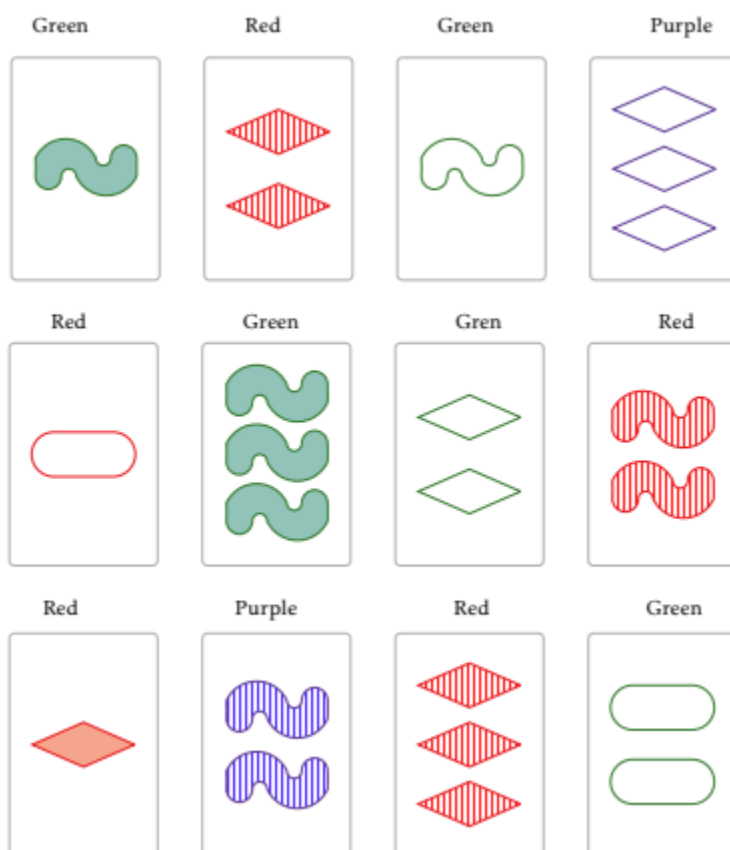
Take moment to convince yourself this is true.
When this happens the dealer places three more cards on the table; repeating until there is a Set.

What is the most number of times the dealer will have to add cards before we can guarantee a Set exists among the dealt cards? i.e. what is the most number of cards that can be on the table before they must contain a Set?

To answer the question above try the following:

Exercise 7. Show it is possible for there to be 15 cards on the table without any **Sets** present. (Hint: Try adding three cards to the 12 card example given above.)

Then try adding more …