Games with Number Cards

Teacher's Notes

This is a collection of games and activities using a 50-card pack made up of 5 sets of cards; each set (of 10 cards) bearing the digits 0 to 9. The aim is to encourage practise in basic number work in a different context.

Suitable packs of cards can be obtained from educational suppliers. A master sheet is included here printed with a set of the 10 cards. These could be photo-copied onto card. While nowhere near as durable as commercially produced packs they will serve the purpose. Certainly it would allow an assessment to be made as to whether an investment in more permanent packs of cards would be worthwhile.

Most of the pages given here contain instructions for playing the various games.These have been arranged and paginated in such a way that, using double-sided printing, then folding and stapling, a 16-page booklet can be made. Otherwise the sheets can be printed on one side only, cut in half and used as A5 sheets.

Some assumptions are implicit in this work, and most of them are concerned with what can best be described as “card ettiquette”. Some reminders:

- A full pack of 50 cards is always used unless otherwise stated.
- The pack is shuffled and cut at the start of any game.
- One player is the dealer, and all players take turns at this.
- Play always starts with the first player on the dealer's left, and moves clockwise around the table. The dealer is the last to play in any single round.
- The dealer is nearly always also a player but, in certain circumstances, may not be.
- **face-up** means that the card lays flat on the table in such a way that its value **can** be seen by all.
- **face-down** means that the card lays, or is held in such a way that its value **cannot** be seen.
- **must** in the rules, means that the player **has** to do whatever it is the particular rule states.
- **may** in the rules, means that the player **can choose** whether or not carry out that particular instruction

Some practical points.

- When groups are being made up, try to ensure that there is at least one adequate reader in each group.
- If the reading ability generally is low: have all groups playing the same game; do the necessary explanation “from the front”; and monitor the first few games that are played very closely.
- Even with good readers misunderstandings do occur and it can sometimes take a few games before these get ironed out.
- Do not leave one group playing the same game for too long. Either change the group or change the game (or both).
- Since so much of the (correct) play depends upon arithmetic, **all players** must be vigilant that cards laid down match the rules. For example, if the rules require two cards to add up to 10, then players must be on the lookout to ensure that there are **two cards** and that they **do add up to 10**
- In the game **17** (which is a simpler version of “Pontoon” or “21”) it might be better sometimes if the dealer is not a player - especially if there are many players.

Note that the game *Ordered Places* does require each player to have an A4 sheet with a pre-printed layout on it. The master for this is included in these pages.

A distinction is made here between games of Patience and Puzzles. They are both games for one player. However, whether a game of Patience can be brought to a successful conclusion depends to a large extent upon luck (plus a little bit of skill). On the other hand, a Puzzle can always be resolved - eventually!

There is on this Web-site an article on Games in the Classroom. It can be found from the CIMT Home Page under the general heading **Games**.

Games with Number Cards

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Much can be done to extend the use of these games by introducing some variations. Here a just a few ideas, many others will suggest themselves as the games are played.

Show Most

- Could be played with the **smallest value** winning = Show Least.
- Hands could be dealt at random.

17

- Could be played to some other total.

Addsnap

- Could be played dealing out 3 cards at a time.
- Could combine the cards with multiplication = Timesnap.

Call 10!

- To avoid the problems that can arise with players being 'out' of the game, add the rule that "Any player holding no cards can still call "Ten!" on seeing two piles whose topmost cards do add to 10 and then, if correct, collects both piles." But the call **must** involve the card which has just been turned.

Magic 15

- Instead of requiring every line to produce the **same** total (of 15), ask for every line to produce a **different** total = Anti-Magic.

Odds

- Use a 4 by 4 array and go for **even** totals = Evens.

Other uses of Number Cards

There is another way of using Number Cards which introduces a "game-like" dimension to the practise of mental arithmetic. It has the advantage of allowing all responses to be seen from the front. It also allows every individual to make a response and be checked rather than the 'traditional' single question/single answer approach.

For this every pupil to be involved has 20 cards, made up of 2 each of the 10 digits (0 to 9). A sum is called out, say "eight add seven"; pupils respond by holding up the cards to display the answer, in this case a "1" and a "7" - the correct way round of course. With this it is not a race to be"first" - but it must be correct.

Once started, there are lots of possibilities, much depending on the ability of the group. There should be a mix of language as well as arithmetic; for instance *"divides", "goes into", "shared", "is a factor of"*, could all get a mention (at the appropriate level).

"Show me an odd (even) number less (greater) than ten."

"What are seven fours?"

"What is the product of three and two?"

"Hold up two cards whose total value is ten . . . is fifteen . . . is eight . ."

"Give me a two-digit number divisible by six."

"Show the smallest (largest) two-digit number divisible by seven."

"Give me a number that goes into twenty four."

"Now show a number, not one, that is a factor of nineteen."

"Hold up two numbers whose product is fifteen."

*"We will now count **up** in threes, starting with four . . . the next is . . ."*

*"Count **down** in twos, starting with twenty one . . . next is . . . next . . ."*

"What is the remainder when fifteen is shared among four."

Write on the board a (largish) number using all different digits,
or use a prepared OHP, and ask several questions on the lines of -

"Which digit is counting the thousands . . . units . . .?"

"Show me a two-digit prime number."

"Give me a prime number bigger than fifty."

"Find a square number between thirty and forty."

"What is the square root of sixty four?"

"What is the cube root of eighty one?"

Addsnap (3, 4 or 5 players + dealer)

In this game the dealer is **not** a player but simply turns up **two** cards at a time. The dealer then gives the two cards to the player who is **first** to call their **total** value correctly.

When all the cards have been dealt, the winner is the player who has collected the most cards.

Roll-Call (A game for 1 player)

Hold the pack face-down and deal off one card at a time, turning it face-up on the table.

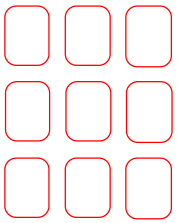
As each card is turned over, count ‘Nought’, ‘One’, ‘Two’, ‘Three’, ‘Four’, and so on up to ‘Eight’, ‘Nine’; then start the count again - ‘Nought’, ‘One’, ‘Two’ and continue like that.

Whenever the card you have just turned over matches the number being counted for that card then the card is put to one side.

When the whole pack has been turned over, score 1 point for every card which has put to one side. Rate your success using:

2 = Poor; 3 = Fair; 4 = Good; 5 = Very Good; 6 = Excellent

Odds (A game for 1 player)



Hold the pack face-down and take one card at a time off the top, turning it face-up.

The card must then be placed so as to become part of a 3 by 3 array like that shown on the right. Once placed a card cannot be moved.

Continue until all 9 places are filled.

Check the totals of the 3 cards in each of the 3 columns (up and down) and each of the 3 rows (across)

The object is to make each of those 6 totals an **ODD** number.

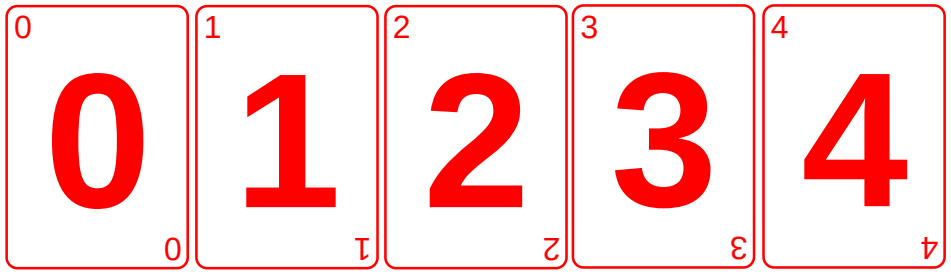
Games with Number Cards

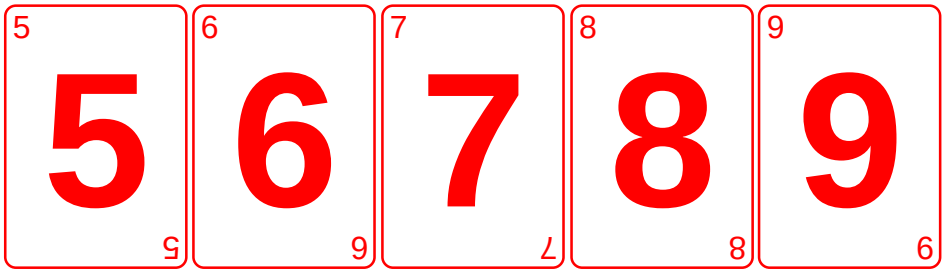
Games for 2 and more players

Games of Patience

Puzzles

all played using a pack of 50 number cards made up of 5 of each of the ten digits 0 to 9.





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Games for 2 or more players

Games for 1

Puzzles

Ten Pair (2, 3 or 4 players)

Remove all the **0**'s from the pack.

Deal 7 cards to each player and put the remainder face-down in the centre. Players take turns.

In one turn a player

- takes **one** card from either of the piles in the centre
- looks among those held for any **pairs** of cards that add together to make **10**
- lays down **all** such pairs found, face-up on the table
- and then may throw away **one** card to a face-up pile in the centre.

A player who lays down a pair of cards which do **not** add up to 10 must pick up **all** the cards laid down in that turn, including the one thrown away. But this **must** be seen and pointed out by the other players before play moves on to the next player.

The winner is the first player to be left holding **no** cards. If there is no winner before all the face-down pack in the centre is gone, then the winner is the player who has the **most** pairs of 10 laid down.

Ten - Up (A game for ONE player)

Remove **all** the '0's and **one** '5' from the pack and put to one side; these cards are not used. Deal out eight cards face-up in a line. Keep the rest in your hand, face-down.

From this layout, any **pair** of cards that add up to **10** may be removed and laid to one side. Then 2 more cards can be dealt from the top of the pack in your hand to fill their places.

The object of this patience game is to see if you can get rid of all the cards in your hand.

Odds & Evens (2 to 6 players)

Deal 8 cards to each player. The remainder of the pack is not needed. Players may look at their cards.

For the first round, players put a card **face-downwards** in front of them. When everyone has done this, the cards are turned over and all of them are added up.

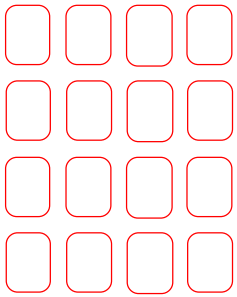
- If this total is **even** then players who laid an **even** number in front of them score a point.
- If this total is **odd** then players who laid an **odd** number in front of them score a point.

When these scores have been recorded, then that round is complete. All the used cards are collected up and laid to one side.

All the following rounds are played in exactly the same way.

After eight rounds, when all the cards have been played, then the winner is the player with the most points.

Ten - Out (A game for ONE player)



Start by dealing out 16 cards to make an arrangement of 4 rows in 4 columns. Hold the remainder of the pack face-downwards in the hand.

If, in any row or any column, 2, 3 or 4 cards can be found which add up to 10, then **all 4** cards in that row or column can be removed and put to one side. Four more cards are then dealt from the pack to fill the spaces.

So the game continues, removing rows or columns where possible, filling the gaps from the pack in hand. The object is to get rid of **all** the cards held in the hand. Remember that the cards adding up to 10 must all be in the **same** row or column.

Make a Difference (2 to 4 players)

Deal 6 cards to each player and **one extra** to the dealer. The rest of the pack is placed face-downwards in the middle. Players may look at their cards.

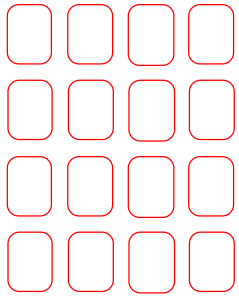
The dealer now selects one card from his or her hand, which **must** be either a 1, 2, 3, or 4, and places this card face-up for all to see. This is the **difference card**.

Players take turns. In one turn a player -

- **must** take a card off the top of the pack in the middle
- **may** lay one pair of cards, face-up, from his or her hand, *and only one pair*, whose difference (take the smaller number from the larger) is the same value as the **difference card**.

When all the pack in the middle has been used up, the winner is the player who has laid down the most pairs.

Unrepeatables (A Puzzle)



Use four 1's, four 2's four 3's and four 4's. That is a total 16 cards.

Put these 16 cards in a 4 by 4 array, that is in 4 rows by 4 columns.

They must be arranged so that in **NO** row or column, **nor** in either of the two diagonals, does any number appear twice.

Show Most (2 to 4 players)

Each player starts with an identical had of 10 cards covering the values 0 to 9. The game is played over 10 rounds.

In each round

- Players select a card from their hand and place it face-down on the table.
- When cards have been placed by all the players they are turned over.
- The player who is showing the highest value card collects the cards and lays them to one side.
- If there is **NO SINGLE** card of the highest value, then no one collects any cards; they are all pushed to one side.

After the 10 rounds are complete, the winner is the player who has collected the greatest number of cards.

Fifteen - Up (A game for ONE player)

Divide the pack into three roughly equal piles and place them face-up in front of you. Though all the cards are face-up the piles should be kept tidy all the time so that only the top card of the pile can be seen at any time.

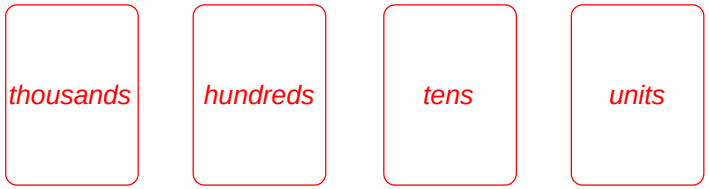
If any two (or all three) of the top cards add up to 15 then those two (or three) can be taken off and laid to one side.

If no 15 can be made then you may move the top card from any one pile and lay it on top of one of the other piles.

The object of this game is to have no cards left in any of the piles.

Ordered Places (2 to 5 players)

Each player needs a copy of the Ordered Places Layout.



The game is played over 5 rounds with a score being kept all the time for each player. A round is made up of 3 bouts.

- **Bout 1** (*tens & units*)
  One card is dealt to each player who **must** place it on either the 'tens' or 'units' space.
  A second card is then dealt to each player who must place it in the space not used before.
  Each player has now made a 2-digit number. The player with the highest number gets 2 points, the next highest gets 1 point. Players with equal (highest) numbers get the same amount of points.
  Record those scores and clear the cards away, but do not put them back in the pack.
- **Bout 2** (*htu*)
  Similar to Bout 1 but, 3 cards are dealt out 1 at a time, and are placed on the 'hundreds', 'tens' or 'units' space as each card is received.
  Remember that a card **cannot** be moved once it has been placed.
  The same scoring system is used.
- **Bout 3** (*all of them*)
  Now 4 cards are dealt out 1 at a time and placed on any of the 4 spaces as each card is received.
  The same scoring system applies

That is the end of a round. All the cards are gathered in and well shuffled before starting the next round.

After 5 rounds the winner is the player with the most points.

17 (2 to 8 players)

Deal 2 cards to each player. Players may look at their cards but do not show what they are holding until the end.

Players are asked, in turn, whether they want another card. This is repeated as often as necessary until everyone has refused, and the game then stops.

The winner is the player whose card values in **total** are **closest** to 17. Note that the total can be **more** or **less** than 17, and that there might be more than one winner.

Nine-Line (A game for ONE player)

Holding the pack face-down, take one card at a time and turn it face-up to make a line of cards on the table.

Every time you see a group of cards (that is a run of cards **lying next to each other** with no others in between) which add up to 9 or a multiple of 9 (like 18, 27, 36 etc.) then that group can be removed from the line and 'thrown away'.

Cards can be moved along to close any gap that is made.

The object of this game is to have no cards left in the line at the end.

Call 10 (2 to 5 players)

Remove all the **0**'s from the pack and put them to one side.

Deal out the remainder of the pack so that each player has the same number of cards. Any cards left over are put to one side.

Players hold their cards in one complete pile, face-downwards and must not look at any card before playing it.

Players take turns taking the top card off the face-down pile and turning it over to make a face-up pile.

If anyone sees that a face-up card which, **added to their own**, makes a total of **10**, then they may call "Ten!" But note that this call **must** involve the card which has been just turned up; it is too late to call once the next card has been turned.

The call must use the **top cards** of the two face-up piles and not some other card which may be seen further down.

The first player to call "Ten!" (and is correct) picks up both their own pile and the other pile, turns them face-down and adds them to the **bottom** of the pile already held in their hand.

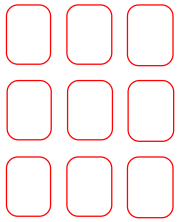
A player who has no cards left in their face-down pile is out of the game. The face-up pile can still be won by those left in.

The winner is the player who is not out at the end.

Magic 15 (A Puzzle)

Take one of each of the cards 1 to 9 and lay them in a 3 by 3 array.

Arrange them in such a way that every line of three cards, up and down, across and diagonally (that is eight different lines) adds up to 15.



Number Building (2 to 5 players)

A complete game is made up of 5 ‘sets’ of 4 ‘rounds’ in each set. Points are scored in each round and it is necessary to keep a record of these.

To start a ‘set’ each player is dealt 10 cards. Any left over are not needed. Players may look at their cards.

- **Round 1**
  Each player selects 1 card and puts it face-down on the table. When everyone has done this the cards are turned over. The player showing the highest number scores 1 point. If 2 or more players show the same highest number, NO points are given. Record the score and move the used cards out of the way. .
- **Round 2**
  Each player now puts 2 cards face-down. When turned over they are placed side-by-side to build a number. So, for example, a ‘5’ and a ‘3’ would be 53. The player with the highest number scores 2 points. Two identical high numbers again means NO points. Record, and clear the used cards away.
  The next two rounds are played in a similar way.
- **Round 3**
  3 cards to score 3 points.
- **Round 4**
  4 cards to score 4 points.

That is the end of a ‘set’. All the cards are gathered in and well shuffled before starting the next ‘set’.

After 5 ‘sets’ the winner is the player who has scord the most points.

Prime Scramble (2 to 5 players)

Remove all the **0**'s from the pack and put them to one side.

Deal out the remainder of the pack so that each player has the same number of cards. Any cards left over are put to one side. Players must **not** touch their cards until dealing is complete.

When every one is ready, players may pick up their cards and start sorting them out.

Each player has to make as many prime numbers as possible, using either a single card or a pair of cards placed side. So, for example, a ‘7’ on its own would do, and so also would a ‘5’ and a ‘3’ which could be arranged to make 53. As each prime is made it is laid on the table.

When a player has made all the primes they think are possible from that hand then they call “Stop!” and all other players must stop laying down any more primes.

The player who called “Stop!” is the winner **provided** that, when the other players look, they confirm that all the numbers laid down **are** primes, and also that the player is **not** holding any more possible primes in the remaining cards. If the player fails on either of these then the winner is the player who laid down the most primes.

To help, here is a list of all the prime numbers less than 100.

2	**3**	**5**	**7**	**11**	**13**	**17**	**19**	
23	**29**	**31**	**37**	**41**	**43**	**47**	**53**	
59	**61**	**67**	**71**	**73**	**79**	**83**	**89**	**97**

Reductions (A Puzzle)

Take one of each of the cards 0 to 9 and lay them out in this order

1	7	3	8	0	9	4	6	2	5

A card may be moved, either to the left or to the right, by jumping over 2 cards to land on top of another card. The jump must be over exactly 2 cards, neither more nor less, and **no** cards are removed.

Using only that rule, find a set of moves that will produce this -

0	1	2	3	4

Prime Patience (A game for 1 player)

Remove all the '0's from the pack. Hold the remainder face-down.

Deal 2 cards face-up. If they are **both even** then throw them away. Otherwise, arrange them side by side to make a 2-digit number.

Decide whether the number you have made is a prime.

If it is, lay the 2 cards to your **right**, otherwise lay them to your **left**.

Deal another 2 cards, and treat them as before. Keep on doing that until all the cards in your hand have been used.

In this game you have won if, at the end, the pile on your **right** (the primes) is bigger than the pile on your **left** (the non-primes).

To help, here is a list of all the 2-digit prime numbers.

11	**13**	**17**	**19**	**23**	**29**	**31**
37	**41**	**43**	**47**	**53**	**59**	**61**
67	**71**	**73**	**79**	**83**	**89**	**97**

Rushten (2 to 5 players)

Deal 5 cards to each player. The remainder of the pack is put face-down in the middle of the table.

In their turns players now

- Take **sets of cards** from their hand which add up to 10 and lay them face-up on the table. (There may be any number of cards in a set, and more than one set can be laid down.) Then -
- draw, from the pack in the centre, the same number of cards as was laid down.
- If unable to make a set of 10 at all, just draw **1** card from the pack in the centre.

When all the cards from the pack in the centre have been used the winner is the player who has laid down the most cards.

Stacking (A Puzzle)

From the pack take out one each of the cards 0 to 4.

Stack them in the order 0, 3, 2, 1, 4 so that when held in your hand face-downwards then the '0' is on the top.

Start by spelling 'one' - saying 'o', 'n', 'e'. As each letter is said the top card of the stack is moved to the bottom. After the last card of the spelling has been moved, take the next card off the top and say "spells one" as you turn it face-up on the table.

Do the same thing for 'two' - saying 't', 'w', 'o', with a top to bottom for each letter, then saying "spells two" as the next card is placed on the table face-up.

Next is 't', 'h', 'r', 'e', 'e'; "spells three". Then 'f', 'o', 'u', 'r', "spells four". The final card is now revealed as you say "and there is nothing left!"

Find a way of stacking the cards '0' to '9' so that they can be produced in order as each number is spelt out.

Spaces (A Puzzle)

Using two each of the cards 1 to 3 they can laid out like this

3 1 2 1 3 2

Notice that between the 1's there is 1 card, between the 2's there are 2 cards, and between the 3's there are 3 cards.

In a similar way, use two each of the cards 1 to 4 and try to lay them out so that between the 1's there is 1 card, between the 2's there are 2 cards, between the 3's there are 3 cards and between the 4's there are 4 cards.

Order Please (A Puzzle)

Take one of each of the cards 0 to 9 shuffle them well and deal them face-up in a straight line.

? ? ? ? ? ? ? ? ? ?

The object is to see how quickly you can get them into order, from '0' to '9'.

The only move allowed is to change over any pair of cards at a time.

Roundabout (A Puzzle)

8 7 6
5 4
3 2 1

Take one of each of the cards 0 to 9 and arrange them in the shape of a hollow rectangle as shown on the left.

The object is to re-arrange them into the order shown the right.

1 2 3
4 5
6 7 8

The cards may only be moved by sliding them into a blank space, without going outside the edges of the original rectangle - so there is only ever **one** empty space that a card can be moved into. No jumping is allowed.

Counting - Out (A Puzzle)

Arrange the four cards '1' to '4' roughly in a circle.

1
4 2
3

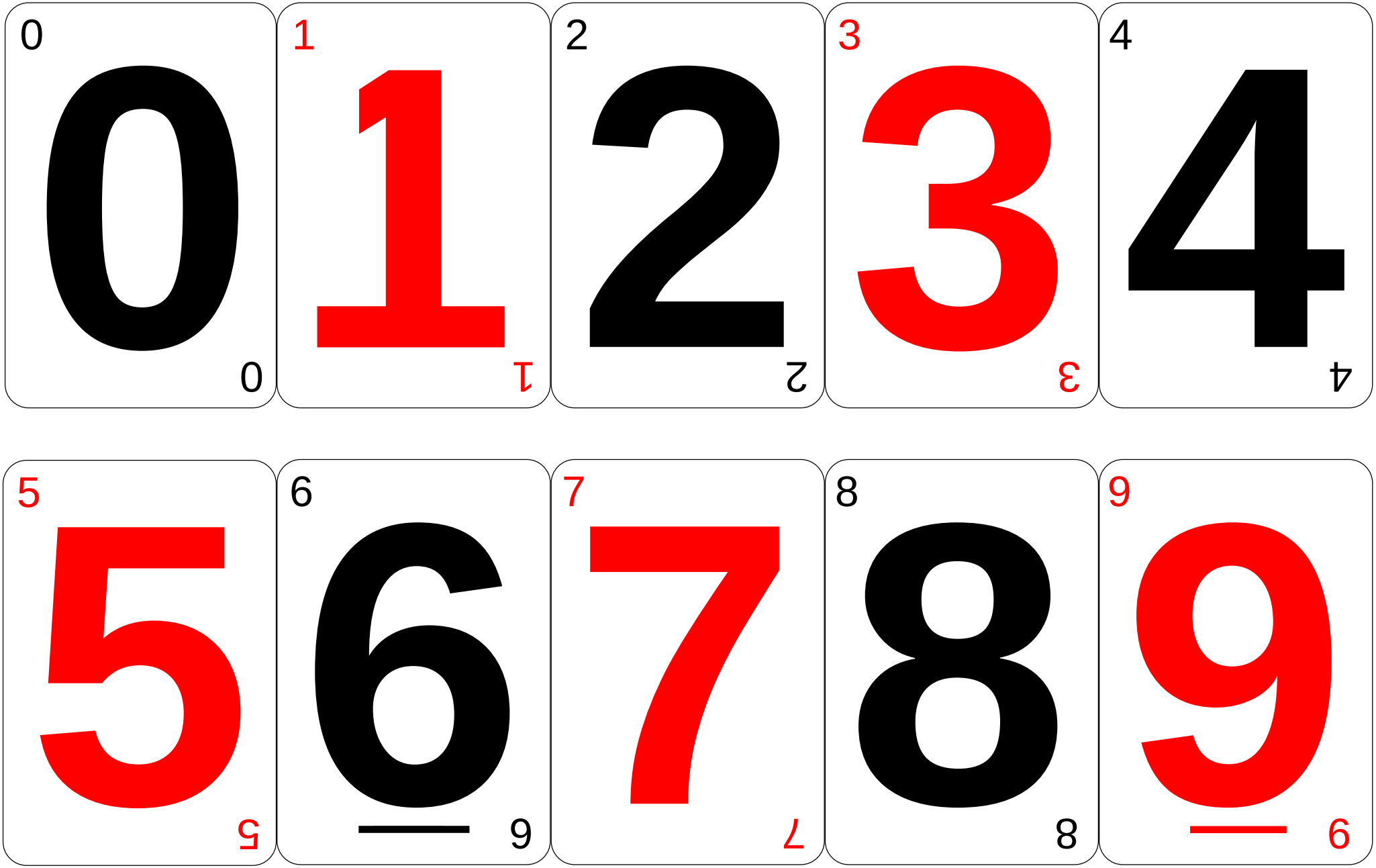
Start counting on '1' and, counting up to 5, move from card to card in a clockwise direction. This finishes on '1', so that card is removed. Go (clockwise) to the next remaining card ('2' in this case) and start counting from there. Again count to 5. This time the finish is on '3' and that card is removed. Only the **even** numbers remain.

Now arrange the cards '1' to '6' in a circle. Can you find what number you must use for the count so as to remove all the **odd** cards?

1
6 2
5 3
4

Remember that the count must start at 1; all movement is clockwise; the same count must be used every time; the card on which the count finishes is removed; and the count re-starts on the next remaining card.

If that is too easy you could try it for 8 cards, and . . . .



Ordered Places Layout