

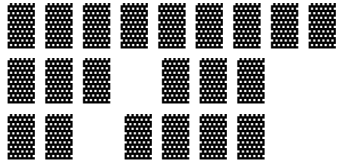
Games and Activities

Noah's Ark

Player 1: 9 red cards

Player 2: 9 black cards

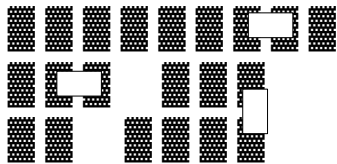
Other cards face down cards in grid, but pattern may be irregular, as shown:



A card in a player's hand is a pair of animals.

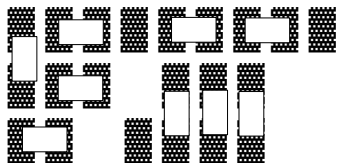
A face down card is a room for one animal.

Players alternate placing their cards across adjacent (vertical or horizontal) cards. For example, the first three moves might result in this board:



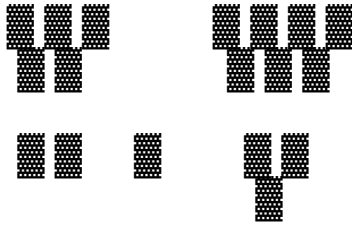
Once a face down card is covered by one face up card, it cannot be used again.

The first player who cannot move loses. For example, the player who has to move next on this board has no move available, and therefore loses:



Nim – Level 1

Players scatter 10 – 20 cards in several loose piles, with various numbers of cards in each pile. For example:



(this is just one of many possibilities)

A turn consists of taking any number of cards, but only from one pile in a given turn.

Players alternate turns.

The player who takes the very last card loses.

Nim – Level 2

This game is similar to Level 1, but the cards are face up. In addition to taking from one physical pile on a turn, players may also choose to take any number of cards from the same suit (hearts, clubs, diamonds, spades), even if they are in different physical piles.

Nim – Level 3

This game is similar to Level 2, but the cards are face up. In addition to taking from one physical pile on a turn or cards of the same suit, players may also choose to take any number of cards of the same value (A, 2, 3, 4, etc.) even if they are in different physical piles.

NOTE: Nim Levels 1 and 2 can be done with the colored markers, using colors in place of suits for the level 2 game.

What's Missing?

Best done with 2-5 players

Start with the “2” and “3” of each suit, and lay out all 8 cards, face up, in random orientations.

Everybody but one player looks away, and that one player removes one card.

Everybody then looks at the pile and then tries to be the first one to name the card that was removed.

2♦ 3♣ 2♥
2♠ 2♣ 3♦
 3♠

In this case, the missing card is the 3♥.

Play continues until one player wins 5 rounds (or any other agreed-upon number).

As the players improve, add more cards, such as the “4” of each suit, the “5” and so on.

Make 10 – Level 1

Best done with 2-4 players

This game uses only the Ace (A) through 9 cards, and the A is considered to be the number 1.

Deal 7 cards to each player, putting the rest in a face down stack in the middle.

Play moves clockwise; each turn consists of laying down a combination of any number of cards that add up to 10. These cards then go on the bottom of the middle stack.

If a player cannot or chooses not to lay down cards adding to 10, the player draws a card from the top of the middle stack and play passes to the next player.

The first player to run out of cards wins.

Make 10 – Level 2

This is the same as the level one game, but there are two additional rules:

1. A player can only lay down two to five cards in one turn.
2. The cards can total 10 or a multiple of 10, such as 20, 30 or 40.

Make 24

Best done with 2-4 players

This game uses only the A through 10 cards.

Begin by dealing 7 cards to each player, putting the rest in a face down stack in the middle.

Play moves clockwise, with each turn consisting of laying down a combination of two to five cards that add up to 24. These cards then go on the bottom of the middle stack.

If a player cannot or chooses not to lay down a combination adding to 24 or a multiple of 24, the player draws a card from the top of the middle stack and play passes to the next player.

The first player to run out of cards wins.

Count to 50

Game uses only 40 cards, A-10 of each suit. Ace (A) is considered to be the number 1.

Students work alone or in teams. Teacher randomly draws 5 cards. Students write combinations of numbers to make every whole number from 1 to 50 (or whatever number is decided on ahead of time).

This game works well as a timed contest, for example, whoever can count the highest in ten minutes.

Example: Cards are 2, 5, 2, 8 and A (1)

$1 = 1$	$12 = 12$	$23 = 22 + 1$	$34 = 2^5 + 2$	$45 = 5 \times (8 + 1)$
$2 = 2$	$13 = 8 + 5$	$24 = 8 \times 3$	$35 = 5 \times (8 - 1)$	$46 = (5 \times 8) + 2 \times (2 + 1)$
$3 = 2 + 1$	$14 = 8 + 5 + 1$	$25 = 5^2$	$36 = 2 \times 2 \times 8 + 5 - 1$	$47 = 5 \times (8 + 1) + 2$
$4 = 2 + 2$	$15 = 5(2 + 1)$	$26 = 5^2 + 1$	$37 = 28 + (5 \times 2) - 1$	$48 = (5 + 1) \times 8$
$5 = 5$	$16 = 8 \times 2$	$27 = 28 - 1$	$38 = 28 + (5 \times 2)$	$49 = (5 + 1) \times 8 + (2/2)$
$6 = 8 - 2$	$17 = 2 \times 8 + 1$	$28 = 28$	$39 = 28 + (5 \times 2) + 1$	$50 = (8 + 2) \times 5$
$7 = 8 - 1$	$18 = 18$	$29 = 28 + 1$	$40 = 5 \times 8$	
$8 = 8$	$19 = 18 + 2/2$	$30 = 28 + 2$	$41 = 5 \times 8 + 1$	
$9 = 8 + 1$	$20 = 5 \times 2 \times 2$	$31 = 2 \times 2 \times 8 - 1$	$42 = 5 \times 8 + 2$	
$10 = 8 + 2$	$21 = 21$	$32 = 2 \times 2 \times 8$	$43 = 5 \times 8 + 2 + 1$	
$11 = 21 - 8 - 2$	$22 = 22$	$33 = 2 \times 2 \times 8 + 1$	$44 = 5 \times 8 + 2 + 2$	

Face Value

One player picks three whole numbers between 1 and 10 and assigns them to the Jack, Queen and King (J, Q and K). Suppose for this example that $J=5$, $Q=3$ and $K = 9$.

The same player then lays out all 12 face cards in a few rows (any number from 1 to 12 rows), and announces the total of each row. For example, the rows might be

J Q K K	26
J Q Q	11
J K K	23
J Q	8

The other player or players then have one minute to solve for the values of J, Q and K. Any answer that correctly matches the total in every row is correct, even if it is different from the one the answer the person who made up the problem had in mind.

For example, suppose the person who sets up the problem assigns $J=4$, $Q=7$ and $K=2$. The cards might be laid out as follows:

J Q K	13
J J Q Q K K	26
J Q	11
K	2

Suppose the other player comes up with the answer $J=2$, $Q=9$, and $K=2$. This would be correct, because it does match the total of each row, even though it does not match the numbers thought of by the person who set up the problem.

The first player to correctly solve five problems wins.

For a more complicated version, also include the Aces (A) in the puzzles and lay down all 16 cards. You can also play with the face cards from two decks to make the game more challenging.

Misere Tic-tac-toe

This is similar to regular tic-tac-toe, but with two key differences:

1. The board does not have to be three rows by three columns. Any size board will do, although it is usually best to keep it under seven rows and seven columns.
2. The first player to get three consecutive cells in a row (vertically, horizontally or diagonally) **loses**. This, of course, is the opposite of regular tic-tac-toe.

Set up the “board” using face-down cards in a grid, and use different colors of pom-pom markers instead of X's and O's.

The image below shows red (R) and green (G) markers. In this case, the green player has lost, as the bold and underlined G's show.

R	G	G	R	R
R	R		R	G
<u>G</u>	R	G	G	
G	<u>G</u>		R	G
R	R	<u>G</u>	G	R

Multiples of 4

1. Roll all 10 dice.
2. Remove one or more dice that total any multiple of 4 (4, 8, 12, 16, 20, and so on).
3. Roll the remaining dice and continue until either you remove all 10 dice, or until you choose to stop. If you remove all 10, you continue your turn by rolling all 10 dice again.
4. If you choose to stop, you “bank” one point for each die removed in the turn; if you roll and do not remove a multiple of 4, your turn ends and you lose all points gained on that turn, but you never lose “banked” points.
5. Players alternate turns until one player has banked 100 or more points. All players get the same number of turns, so the first player to get 100 points does not necessarily win.

Factor Subtractor

1. Put 20 to 50 pom-pom markers in a single group on the table, and carefully count them.
2. Players alternate removing markers; in every case, the number of markers removed must evenly divide the number of markers remaining at the beginning of the move.
3. The person who takes the last marker loses.

The following example shows a possible game starting with 38 pieces.

Player	Pieces	Removed	Notes
1	38	2	2 is a factor of 38
2	36	9	9 is a factor of 36
1	27	1	1 is a factor of 27
2	26	13	13 is a factor of 26
1	13	1	1 is a factor of 13
2	12	4	4 is a factor of 12
1	8	4	4 is a factor of 8
2	4	1	1 is a factor of 4
1	3	1	1 is a factor of 3
2	2	1	1 is a factor of 2
1	1		(player 1 loses – must take last piece)

For details about this game, see:

<http://www.cut-the-knot.org/SimpleGames/Aliquot.shtml>

What's the Question Mark?

This is not a competitive game; it is an activity for parent and student. The parent arranges a series of the number pieces to form an equation, using a question mark to stand for an unknown number. The goal is for the student to determine the value of the question mark.

Start with simple equations, like $5 + ? = 7$ and work up to more complex equations like $5 \times ? - 2 = 28$, or even $4 \times ?^2 + 8 - 6 = 102$.

Make the Equation

One player comes up with an equation using the magnetic symbols and places the symbols in a jumbled pile. The other player must rearrange the symbols into a valid equation. Any valid equation works, even if it is not the one that the first player had in mind.

Example (jumbled):

$$2 \ 4 \ 3 \ 2 \ 9 \ x =$$

Example (solved):

$$2 \ 3 \ x \ 4 = 9 \ 2$$

Note that it is important for both players to agree on what symbols and how many numbers may be used.

Addition Solitaire

- 1) Shuffle 40 cards, Ace to 10 of each suit.
- 2) Arrange them face down into 8 piles, as shown below:

8 cards	8 cards	6 cards	6 cards
4 cards	4 cards	2 cards	2 cards
- 3) Flip over the top card on each pile, leaving each face up card on the top of its pile.
- 4) Roll the dice and add to get their total.
- 5) Using the face up cards, try to find a card or combination of cards whose total matches the total on the dice. Ace=1, 2=2, 3=3, and so on.
- 6) If you can find such a card or combination, set them to the right side of the playing area. If you cannot find such a card or combination, remove any one face up card and set it to the left. This is the "penalty area."
- 7) Flip over the top card on each pile from which you removed a card. If you removed a pile's last card, there will be no new card to flip.
- 8) Continue playing as described above until all cards are off the board.
- 9) Your score is the total of the card values in the penalty area. The objective of the game is to minimize this total.

Advanced Addition Solitaire

This is the same as the basic Addition Solitaire game described above, but steps 1 and 4 are different.

In step 1, you use all 52 cards, with J=11, Q=12, and K=13.

In step 4, instead of adding the three dice to get a total, you can pick any one of three totals by multiplying one dice by the sum of the other two.

For example, if you roll 2, 5, and 6, the total you try to make in step 5 can be any of the values 22, 40, and 42, as shown below:

$$2 \times (5 + 6) = 22$$

$$5 \times (2 + 6) = 40$$

$$6 \times (2 + 5) = 42$$

Python

This is a good game for three or four players, each of whom has one color of marker. Play begins with 49 cards arranged in a 7x7 grid, as shown below.

- 1) Each round begins with each player rolling one die to determine the order of play. Play proceeds from highest value to lowest. If two or more players have the same value, they roll again to break the tie.
- 2) In the order shown by the dice, each player places a marker on the board.
- 3) The players re-roll and continue in the same way for all 12 rounds.
- 4) The objective is to form the longest “python,” which is a consecutive series of spaces marked of the same color. Each marker may be used only once in a python. The python may go up, down, left, or right, but not diagonal.

This example shows a game with four colors: red, green, blue, and yellow. In this case, the longest python is length 7, belonging to green (G).

R	Y	R	B	R	G	R
R	<u>G</u>	<u>G</u>	Y	G	B	Y
B	<u>G</u>	<u>G</u>	<u>G</u>	B	B	R
B	<u>G</u>	R	Y	G	B	Y
B	<u>G</u>	Y	R	Y	G	B
Y	R	B		Y	R	G
B	Y	R	Y	R	B	Y