Numeracy warm-up games  
– with playing cards or 10-sided dice

**Introduction**

**The reasons for using games**
Apart from motivation, games allow the building of confidence with number facts. For this reason, competitive games, when some players more often lose, are not recommended. Games are not a substitute for understanding the meanings of the operations. The experience of playing games in small groups has the additional advantage of developing social skills.

**How often to use games**
Many teachers use a simple game as a 10-minute warm-up each session.

**How to introduce games**
Teach the game to one small group by playing it with them and explaining the rules as you go. Sometimes it is wise to try to lose as well. Then organise those students to teach the others.

**Buying and storing equipment**
These games are designed so that only dice (10-sided with values 0 to 9, and occasionally regular – 1 to 6) or playing cards are needed. Sometimes grids on paper are required. When buying cards, it is best to try to get each pack with a different design on the back. This greatly facilitates sorting when they get mixed, as they inevitably will! A set of 30 dice, and 10 packs of cards should be enough for all these games. Grammatical note: “one die, two dice”.

**List of games (hyperlinked)**

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Place value (whole numbers)

Biggest number

Two-digit version:
Use: Cards 1 to 10, with Ace = 1 and 10 means 0, or one 10-sided die for each pair.

Two or three players.
Shuffle the pack of cards, invert.
Each player draws two spaces – for tens and ones.
• Take turns to remove one card (or roll the die), and
• place it on either tens or ones space.
  The card cannot be moved after placing.
  (For the dice game, the digit is written into the tens or ones place.)
• After two cards are taken, the player with the larger number wins.
Alternatives: smaller number wins, number closest to 50 wins.

Three or more digit version: Use three or more spaces.

Race to 120
Use: dice or cards (1 to 9), and sewing tape and at least 20 minis and 12 longs. Tape the sewing tape to the table.

Two players.
On your turn you roll the dice (or draw a card from an inverted pile).
You take that number of minis, and place them next to the sewing tape, starting your line at 0. Whenever you can exchange 10 minis for a long, this should happen.
The number you have reached is indicated in two ways: the number on the sewing tape, and also the number of longs (tens) and minis (ones). These should match, reinforcing the place value of the number.
The goal of the game is to reach 120 first. (Do not stop at 100, as many students have trouble with the numbers after that.)
Adding (whole numbers)

Add to 20

Snap to 10

*Use:* a set of cards (1 to 9), or one 10-sided die, and a block to be grabbed!

*Up to four players.*

Shuffle the cards. Turn the pack upside down.

- One player turns over the cards one at a time (or rolls the die)
- If two cards (or two die numbers) in a row add to 10, the player who notices this grabs the block.

Snatch

*Use:* Counters, two or three 6-sided dice, advancing to two or three 10-sided dice when ready.

Alternatively use cards (1 to 6, or 1 to 10)

Each player starts with 10 counters.

*Up to five players.*

On your turn you roll the dice (or choose a number of cards) and say the total.

- If correct you get one counter from each player.
- If wrong you give one counter to each player.

At the end, the player with the most counters wins.

Roll and add

*Use:* two 6-sided (or 10-sided) dice or cards 1 to 6 (or 1 to 10). You also need a number line from 0 to 12 (or 20) for each player and counters to cover the numbers on the line.

*Two players.*

On your turn

- roll the dice, or choose two cards.
- add the numbers and cover up the sum on the number line. (Note that 0 and 1 cannot be covered.) If number is already covered, pass.

The winner is the one who covers all numbers (2 to 12 (or 20) first.

Fish to 20

*Use:* a pack of cards (1 to 9)

*Four players.*

Shuffle the cards and deal out five to each player. Invert the others.

The aim of the game is to find three or four cards that add to 20.

- You put next to one another cards that could add to 20 with the addition of more cards.
- On your turn you ask the player on your right for a missing card.
- For example, suppose you have 4, 4, 7 and need 5 to reach 20. You ask for a 5.
- If the player has the requested number it must be handed over.
- If you do not get the missing card you are told to “Fish!”
- You pick up one card from the inverted deck.
- At any time if you have the set adding to 20 you put them down for all to see.
- If you cannot put out a sum to 20 you simply continue to hold the cards. You ask only on your turn.

The winner is the first person to get rid of all their cards.
Addition War

*Use*: cards 1 to 10, with 10 = 0.

*Up to four players.*

Shuffle the cards and deal out all the cards to the players. Any left over should be placed aside. Players leave the cards inverted in a pile in front of them.

On your turn, turn over two cards and say the total out loud. The player with the largest answer wins all the cards (two from each other player).

If any players have the same answer, then it is “war”. Only those players with equal answers play off and the winner takes the losers’ cards.

The winner is the one with the greatest number of cards when any player loses all cards.

Number rummy

*Use*: cards 1 to 9.

*Up to four players.*

Shuffle the cards, and deal seven to each player. Invert the rest (face down). Turn over one to start a ‘showing’ pile.

On your turn,

- pick up a card – either the one showing, or one of the inverted cards
- put down a set of two or more cards that add to 10
- put down a card on the showing pile.

When someone runs out of cards, each player gets one point for each card in sets on the table, but subtract one point for each card still in their hand. The winner has the most points.

Magic triangle (1 to 6)

*Use*: cards 1 to 6 (one set for each player)

*Up to four players.*

Players compete to solve this problem.

- Place the six cards on the circles in this triangle diagram, so that each line of the triangle has the same total.

There are several possible answers. Players earn one point for each different solution to the problem.

Add to 99

*99 \frac{1}{2}*

*Use*: a complete pack of cards.

Some cards have special values – Aces are worth 0, 10s are worth –10, and each picture card is worth \( \frac{1}{2} \). The number 2 cards are very special – any 2 takes the value immediately to 99 \( \frac{1}{2} \).

*Three or four players.*

Shuffle and deal each player three cards and invert the rest.

Turn over the top card to start a TOTAL pile.

- On your turn, put a card onto the total pile and call out the new total – but remember the special values! Then take a new card from the inverted pile.

The aim is to reach exactly 99 \( \frac{1}{2} \) without going over.

If a player cannot play without going over, then the previous player wins.
Make an addition fact
*Use:* a pack of cards, with Ace = 1, 10 = 0 and pictures = 1
*Up to five players.*
Shuffle the cards and place them so the top number is showing.
On your turn you
• pick up the top card
• put down on the table any cards that make an addition fact, using two cards for two-digit numbers
• put one card onto an inverted pile
The game ends when there are no more cards to pick up. The winner has the most cards on the table as addition facts.

Build a problem
*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
*Three or four players.*
Draw up the grid for the problem (see right).
On your turn
• take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
• When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
• When you hold four cards for the problem you must put down one card before picking up another.

Build the greatest sum
*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
Shuffle and invert the pile.
*Three or four players.*
Draw up the grid for the problem (see right).
• On your turn take four cards.
  Assemble them to make the greatest sum (total).
The player with the biggest total wins.

31
*Use:* all four cards 1 to 6 (24 cards in total)
*Two players.*
Place the 24 cards face up in the following arrangement.
• On your turn, turn over one card and say out loud the total of the turned over cards.
The winner is the player who makes the total exactly 31, or who forces their opponent to go over 31.
(This game has a hidden twist, so it is worth playing many times.)

44
*Use:* all four cards 1 to 9 (36 cards in total)
*Two players.*
Place the 36 cards face up in the following arrangement.
• On your turn, turn over one card and say out loud the total of the turned over cards.
The winner is the player who makes the total exactly 44, or who forces their opponent to go over 44. (This game has a hidden twist, so it is worth playing many times.)
Magic triangle (1 to 9)
*Use*: cards 1 to 9 (one set for each player)
*Up to four players.*
Players compete to solve this problem.
- Place the nine cards on the circles in this triangle diagram, so that each line of the triangle has the same total.
There are several possible answers. Players earn one point for each different solution to the problem.

Add hundreds or more
Race to 120
*Use*: dice or cards (1 to 9), and sewing tape and at least 20 minis and 12 longs. Tape the sewing tape to the table.
*Two players.*
- On your turn you roll the dice (or draw a card from an inverted pile).
- You take that number of minis, and place them next to the sewing tape, starting your line at 0.
- Whenever you can exchange 10 minis for a long, this should happen.
The number you have reached is indicated in two ways: the number on the sewing tape, and also the number of longs (tens) and minis (ones). These should match, reinforcing the place value of the number.
The goal of the game is to reach 120 first. (Do not stop at 100, as many students have trouble with the numbers after that.)

Build a problem
*Use*: cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
*Three or four players.*
Draw up the grid for the problem (see right).
- On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
- When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
- When you hold six cards you must put down one card before picking up another.
Note: Dotted rectangles are optional

Build the greatest sum
*Use*: cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
Shuffle and invert the pile.
*Three or four players.*
Draw up the grid for the problem (see right).
- On your turn take six cards.
- Assemble them to make the greatest sum (total).
The player with the biggest total wins.
Subtracting (whole numbers)

Subtract from up to 20

Number line roll
*Use:* cards (1 to 6 or 1 to 9) or one six-sided or ten-sided die. You also need a number line 0 to 20 and a token for each player.

*Two players.*

Both players start at 10.

Shuffle the cards and choose one (or roll a die).

- On the first turn add the number rolled to move your token. On your second turn subtract.
  
  The winner is the first to go over 20 or back to 0.

Cover up

*Use:* two 6-sided or 10-sided dice or cards (1 to 6 or 1 to 10) and a number line from 0 to 20.

*Two players.*

- On your turn roll the dice, or choose two cards. Cover up the sum or the difference (your choice).

Eventually it will not be possible to cover a sum or a difference. Here the game ends. The winner has covered the most numbers.

Take away up to 3

*Use:* a pile of counters (about 20)

*Two players.*

- Count the counters.
- On your turn you must take away 1, 2 or 3 (but no more) from the pile. Say how many are left.
- The winner is the player who takes away the last counter.

Players will eventually discover the logic in this game.

For this reason it is worth playing many times.

*Variation:* change the upper limit of counters that can be taken on each turn, e.g. 1, 2, 3 or 4.

Give and take

*Use:* cards 1 to 10 or 10-sided dice.

*Up to five players:*

Shuffle and deal each player five cards. Invert the others, and turn over the top one

- On your turn you try to form an expression that is equal to the target number turned up – using only adding and/or subtracting.

You do not have to use all five cards, but you win points for every card you use.

Then take another five cards each, and turn over another target number.

Build a problem

*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.

*Three or four players.*

Draw up the grid for the subtraction problem (see right).

- On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
- When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
- When you hold four cards you must put down one card before picking up another.

Note: Dotted rectangles are optional.
31 ‘on the nose’ (add and subtract)
*Use:* a pack of cards, with Ace = 1 and pictures = 0, or a 10-sided die.
*Up to five players.*
Shuffle and deal three cards to each player. Invert the other cards, but turn over the top card to start a ‘total’ pile. (For die version, simply roll the die once to get the starting ‘total’.)
- On your turn you choose a card (roll the die) and add, or subtract to get a new ‘total’. Say the operation and the new total.
- The next player has to use that new ‘total’ and continue.
The winner is the player who gets the total to exactly 31 ‘on the nose’.

Subtract from up to 99
*Back and forth*
*Use:* a complete set of cards, with Ace = 1, J = 11, Q = 12 and K = 13.
*Two players.*
Shuffle the cards, and give each player half each.
One player ‘Adds’ and the other ‘Subtracts’. Swap roles after each game.
The score starts at 50.
- You take turns to put out one card and add (or subtract) that value from the current total.
If the total reaches 65 or more, Add wins, and if it reaches 35 or less, Subtract wins.
*Easier version:* Start at 15 with a range of 0 to 30.
*Harder:* Start at 100, range 85 to 115.

Make a subtraction fact
*Use:* a pack of cards, with Ace = 1, 10 = 0 and pictures = 1
*Up to five players.*
Shuffle the cards and place them so the top number is showing.
On your turn you
- pick up the top card
- put down on the table any cards that make a subtraction fact, using two cards for two-digit numbers
- put one card onto an inverted pile
The game ends when there are no more cards to pick up. The winner has the most cards on the table as subtraction facts.

Number rummy
*Use:* cards 1 to 9.
*Up to four players.*
Shuffle the cards, and deal seven to each player. Invert the rest (face down). Turn over one to start a ‘showing’ pile.
On your turn,
- pick up a card – either the one showing, or one of the inverted cards
- put down a set of two or more cards that make an answer of 10 by adding or subtracting or both. (You must explain this to others.)
- put down a card on the showing pile.
When someone runs out of cards, each player gets one point for each card in sets on the table, but subtract one point for each card still in their hand. The winner has the most points.
Build a problem
*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.

*Three or four players.*

Draw up the grid for the problem (see right).

- On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
- When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
- When you hold four cards you must put down one card before picking up another.

Build the greatest difference
*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.

Shuffle and invert the pile.

*Three or four players.*

Draw up the grid for the problem (see right).

- On your turn take four cards. Assemble them to make the greatest difference (total).

The player with the biggest difference wins.

Race from 120
*Use:* dice or cards (1 to 9), and sewing tape and at least 20 minis and 12 longs.

Tape the sewing tape to the table.

*Two players.*

- On your turn you roll the dice (or draw a card from an inverted pile). You take that number of minis, and place them next to the sewing tape, starting their line with 12 longs = 120.
- Whenever you can exchange a long for 10 minis, this should happen.

The number you have reached will be indicated in two ways: the number on the sewing tape, and also the number of longs (tens) and minis (ones). These should match, reinforcing the place value of the number.

The goal of the game is to reach 0 first.

Subtract from up to hundreds or more

Build a problem
*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.

*Three or four players.*

Draw up the grid for the subtraction problem (see right).

- On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
- When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
- When you hold six cards for the problem you must put down one card before picking up another.

Note: dotted spaces are optional

In the second grid, the tens digit is 0.
Build the greatest difference

*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
Shuffle and invert the pile.

*Three or four players.*
Draw up the grid for the problem (see right).
On your turn take six cards. Assemble them to make the greatest difference (total).
The player with the biggest difference wins.

For the second grid take seven cards.

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**Multiplying (whole numbers)**

**Multiply single digits**

**Mutlo**

*Use:* Cards (2 to 9) or two 10-sided dice and 4x4 grid for each player.

**Any number of players.**
Each player writes 16 different products into the 4x4 grid. (Note that the products involve factors from 2 to 9, so products will be from 4 to 81.)
Players shuffle and invert a pack of cards.
- Someone chooses two cards (or rolls two dice) and all players search for that product on their grid. If it there they cross it out. (Other players can check their honesty.)
This continues until one player gets four in a line (horizontally, vertically or diagonally). This person is the winner.

**Yahtzee Junior (six-sided dice)**

*Use:* five six-sided dice

**Up to three players:**
There are six turns for each player. The aim is to get the highest score, with as many 1s, 2s, 3s, 4s, 5s, and 6s as possible.
- On your turn, roll all five dice at once.
- Choose one of these numbers for which to aim.
- Take the dice that do not contribute to your score, and roll them again.
- You may do this a third time on any one turn. At the end of the three rolls, write a score in the table (see below).
After the six turns for each player, the highest total wins.

**Multiplication War**

*Use:* cards 1 to 10, with 10 = 0.

**Up to four players.**
Shuffle the cards and deal out all the cards to the players. Any left over should be placed aside.
Players leave the cards inverted in a pile in front of them.
- On your turn, turn over two cards and say the product out loud.
  The player with the largest answer wins all the cards (two from each other player).
- If any players have the same answer, then it is "war". Only those players with equal answers play off and the winner takes the losers' cards.
The winner is the one with the greatest number of cards when any player loses all cards.
Make a multiplication fact
*Use:* a pack of cards, with Ace = 1 and pictures = 0
*Up to five players.*
Shuffle the cards and place them so the top number is showing.
  - On your turn you pick up the top card.
  - Put down on the table any cards that make a multiplication fact, using two cards for two-digit numbers.
  - Put one card onto an inverted pile
The game ends when there are no more cards to pick up.
The winner has the most cards on the table as multiplication facts.

Build a problem
*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
*Three or four players.*
Draw up the grid for the problem (see right).
  - On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
  - When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
  - When you hold four cards you must put down one card before picking up another.

Multiply two digits by one digit
Build a problem
*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
*Three or four players.*
Draw up the grid for the problem (see right).
  - On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
  - When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
  - When you hold five cards you must put down one card before picking up another.

Build the greatest product
*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
Shuffle and invert the pile.
*Three or four players.*
Draw up the grid for the problem (see right).
  - On your turn take three cards.
  - Assemble them to make the greatest product.
The player with the biggest product wins.
Multiply with two or more digits

Build a problem
Use: cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
Three or four players.
Draw up the grid for the problem (see right).
• On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
• When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
• When you hold five cards you must put down one card before picking up another.
Note: Dotted rectangles are optional

Build the greatest product
Use: cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.
Shuffle and invert the pile.
Three or four players.
Draw up the grid for the problem (see right).
• On your turn take five cards.
Assemble them to make the greatest product.
The player with the biggest product wins.
For grid 2, take 6 cards.

Dividing (whole numbers)
Divide two digits by one digit
Make a division fact
Use: a pack of cards, with Ace = 1 and pictures = 0
Up to five players.
Shuffle the cards and place them so the top number is showing.
• On your turn you pick up the top card.
• Put down on the table any cards that make a division fact, using two cards for two-digit numbers
• Put one card onto an inverted pile
The game ends when there are no more cards to pick up.
The winner has the most cards on the table as division facts.

Divides
Use: Cards (1 to 10, with 10 having value of 0) or three 10-sided dice.
Two to five players.
Shuffle the cards and invert the pile.
• On your turn you take three cards (or roll the three dice).
• You have to make a two-digit number from any two cards (dice) and divide by the third.
• You get one point for each exact division you can make, and show to the other players.
  (For example, 2, 3 and 7 can make $27 \div 3 = 9$ and $72 \div 3 = 24$, for two points.)
• Put the used cards into another pile. When you run out of the first pile, shuffle again and continue.
The winner has the highest score when you decide to end.
**Biggest remainder**

*Use:* Cards (1 to 10, with 10 having value of 0) or three 10-sided dice.

*Two to five players.*

Shuffle the cards and invert the pile.

- On your turn you take three cards (or roll the three dice).
- You have to make a two-digit number from any two cards (dice) and divide by the third.
- You get the value of the biggest remainder you can make, and show to the other players.
  (For example, 2, 3 and 7 can make $32 ÷ 7 = 4$ remainder 4, for 4 points.)
- Put the used cards into another pile. When you run out of the first pile, shuffle again and continue.

The winner has the highest score when you decide to end.

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**Remainder game (up to 6)**

*Use:* a copy of the grid (see last page) and one six-sided die or a pack of cards (using only 1 to 6). Tokens for each player.

*Two or three players.*

Each player starts on 13.

- On your turn you roll the die and divide that number into the number your token is on.
- You move in the direction of the arrow by the remainder.
  (For example roll 3 when on 13, makes $13 ÷ 3 = 4$ remainder 1, so you move 1.)
  Note that some divisions will have no remainder, so you cannot move.

The first to get to the centre wins. You do not have to get there exactly.

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**Remainder game (up to 10)**

*Use:* a copy of the grid (see last page) and one ten-sided die or a pack of cards (1 to 10).

Tokens for each player.

*Two or three players.*

Play as above, but now you will be dividing by numbers 1 up to 10.

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**Subtract-a-facta**

*Use:* one six- or ten-sided die or a pack of cards. These are only used once at the start of each game.

*Two players.*

At the start of the game one player rolls the die twice (or takes two cards)
- the first for the tens digit and the second for the ones digit.

This creates the starting number. It is written down.

- On your turn you choose one of the factors of the number (except the number itself) and subtract that factor from the number.
  You write down the answer to the subtraction.
  For example, start with 18. You may subtract 1 or 2, 3, 6 or 9 and you write down $17 [=18–1]$ or $16 [=18–2]$, $15 [=18–3]$, $12 [=18–6]$, or $9 [=18–9]$.
  This answer becomes the starting number for the next player.

This continues until one player – the winner - is able to write 1.
(You cannot go further, because the only factor of 1 is 1, the number itself).

*Typical game:*

Build a problem

*Use:* cards 1 to 9 and Jacks (value 0), remove 10s, Qs, and Ks.

*Three or four players.*

Draw up the grid for the problem (see right).

- On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
- When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
- When you hold four cards you must put down one card before picking up another.

Note: Dotted rectangles are optional

Build the greatest quotient

*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.

Shuffle and invert the pile.

*Three or four players.*

Draw up the grid for the problem (see right).

- On your turn take three cards. Assemble them to make the greatest quotient (division answer).

The player with the biggest quotient wins.

Divide three or more digits by one digit

Build a problem

*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.

*Three or four players.*

Draw up the grid for the problem (see right).

- On your turn take one card. Hold them in your hand until you have a set of cards that makes a correct problem.
- When the cards are assembled to make a correct problem, this is where you put them to win the game – if you do it first!
- When you hold seven cards you must put down one card before picking up another.

Note: Dotted rectangles are optional

Build the greatest quotient

*Use:* cards 1 to 9 and Jacks, remove 10s, Qs, and Ks.

Shuffle and invert the pile.

*Three or four players.*

Draw up the grid for the problem (see right).

On your turn take four cards. Assemble them to make the greatest quotient (division answer).

The player with the biggest quotient wins.

For Grid 2, take five cards.
Divisible by 9 (two digits)

*Use:* a pack of cards (1 to 9 and Jacks = 0), or a 10-sided die.

*Any number of players.*
- Shuffle the cards and choose two (or roll the die twice).
- These two digits can form two 2-digit numbers. (For example, 3 and 5 form 35 and 53.)
- Subtract the smaller from the larger.
- Divide the difference by 9. Does it always divide exactly?

How is the quotient related to the two digits used to form the numbers? Does this always work?

Divisible by 9 (three digits reversed)

*Use:* a pack of cards (1 to 9 and Jacks = 0), or a 10-sided die.

*Any number of players.*
- Shuffle the cards and choose three (or roll the die three times).
- Reverse these three digits to form two 3-digit numbers. (For example, 1, 3 and 5 can form 315 and 513, or 531 and 135.)
- Choose any pair of these, and subtract the smaller from the larger.
- Divide the difference by 9. Does it always divide exactly?
- Divide that answer by 11. Does it always divide exactly?

How is the quotient related to the digits used to form the numbers? Does this always work?

Divisible by 9 (three digits in any order)

*Use:* a pack of cards (1 to 9 and Jacks = 0), or a 10-sided die.

*Any number of players.*
- Shuffle the cards and choose three (or roll the die three times).
- If the digits are different, these three digits can form six different 3-digit numbers. (For example, 1, 3 and 5 can form 135, 153, 315, 351, 513, and 531.)
- Choose any pair of these, and subtract the smaller from the larger.
- Divide the difference by 9. Does it always divide exactly?

Divisible by 9 (any number of digits in any order)

*Use:* a pack of cards (1 to 9 and Jacks = 0), or a 10-sided die.

*Any number of players.*
- Shuffle the cards and choose any number of cards (or roll the die any number of times).
- If the digits are different, these digits can form many different many-digit numbers.
- Choose any pair of these, and subtract the smaller from the larger.
- Divide the difference by 9. Does it always divide exactly?

Order of operations (whole numbers)

*Note about order of ‘mixed operations’*
This is often known as BODMAS, but this word gives the wrong instructions unless it is understood correctly.
- Anything in brackets first.
- Then any powers (squares, etc).
- Then, in the order they come (L to R) multiplications and divisions.
- Finally, in the order they come (L to R) additions and subtractions.
Got it!
*Use: cards for numbers 1 to 10*

*Up to four players.*

Deal six cards to each player, invert the rest, and turn over the top card. This will be the target.

- At the same time, each player try to use as many of their cards as possible to make an expression that is equal to the target number. Two-digit numbers may be used using two cards.
- Players get one point for each card used in their expressions.

Then combine all the cards, reshuffle and deal six cards. Continue.

**Sentences**

*Use: one pack of cards, with picture cards worth 0.*

*Up to three players.*

Shuffle the cards and deal them all out so all players can the same number of cards.

- At the same time you have to try to complete the four problems on the grid at right. Two digits may be used for any number, but require two cards.
- When one player has completed all sentences, the game is over.
- Players check each other’s sentences.

Each player gets one point for each card used in a correct sentence.

**100 ‘on the nose’**

*Use: a pack of cards, with Ace = 1 and pictures = 0, or a 10-sided die.*

*Up to five players.*

Shuffle and deal three cards to each player. Invert the other cards, but turn over the top card to start a ‘total’ pile.

(For die version, simply roll the die once to get the starting ‘total’.)

- On your turn you choose a card (roll the die) and use any operation (add, subtract, multiply or divide) to get a new ‘total’. Say the operation and the new total.
- The next player has to use that new ‘total’ and continue.

The winner is the player who gets the total to exactly 100 ‘on the nose’.

**Equation Rummy**

*Use: a pack of cards.*

*Up to four players.*

Shuffle the cards, invert the pile, and turn over the top card so it is ‘showing’.

On your turn, take a card – either an inverted one or the top card that is showing. You may then put down any sets of three or more cards that form equations.

Example: with 2, 3, 4, 10 you can make $2 \times 3 + 4 = 10$.

You must also put down a card on the ‘showing’ pile.

When someone uses up all their cards (including putting one onto the ‘showing’ pile) the game stops.

You get one point for each card used in an equation, but subtract one point for each card left in your hand.
Number Rummy

*Use*: cards 1 to 9.

*Up to four players.*

Shuffle the cards, and deal seven to each player. Invert the rest (face down). Turn over one to start a ‘showing’ pile.

On your turn,
- pick up a card – either the one showing, or one of the inverted cards
- put down a set of two or more cards that make an answer of 10 by using any operations. (You must explain this to others.)
- put down a card on the showing pile.

When someone runs out of cards, you get one point for each card in your sets on the table, but subtract one point for each card still in your hand.

The winner has the most points.

Four 4s (2s, 3s, 5s, 6s, etc)

*Use*: cards, split so that each player gets four of one number.

*Up to eight or nine players*

Players work to get an expression for as many single digit numbers as they can, using their four digits. For example, four 4s can make 1 in this way: \((4 + 4) \div (4 + 4) = 8 \div 8 = 1\). Often there will be more than one way to make the target number, but sometimes it is not easy!

Build an expression

*Use*: a pack of cards, with Ace = 1 and pictures = 0, or a 10-sided die.

*Up to five players.* Each player draws the form of the expression agreed by the players for that game (see examples below).

Shuffle the cards and place them so the top number is showing.

On your turn you
- **DIE**: roll the die and use it – by writing that number into a square on the expression – or pass. OR
- **CARDS**: use the top card number showing – by writing that number into a square on the expression – or pass, and turn the top number upside-down.

The first player to complete the expression wins.

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\begin{align*}
\Box + \Box + \Box - \Box &= 13 \\
(\Box + \Box) \times (\Box \div \Box) &= 24 \\
(\Box + \Box) \times (\Box + \Box) &= 36 \\
(\Box \times \Box) - (\Box + \Box) &= 20 \\
(\Box - \Box) \times (\Box \div \Box) &= 12 \\
(\Box + \Box) \div (\Box - \Box) &= 5
\end{align*}
\]
Remainder game
Start on 13. Roll die.
Divide position number by die number.
Move by the remainder.