THIRD SPACE LEARNING

KS3 Maths Games

24 maths games for students in Year 7, 8 and 9

KS3

Contents

** Printable resources provided*

Year 7 Games

The curriculum in Year 7 is more diverse and varied than in Key Stage 2. The focus broadens to include algebra, ratio and proportion and probability. Whilst all the elements of calculation, place value and fractions are still covered within Key Stage 3, it is instead under the heading 'Number'. The games in this section will all help Year 7 pupils to build upon the skills developed in Year 6, and to develop skills also covered in Year 7.

1. Prime Numbers Game

This fun maths game gets pupils thinking about prime numbers and factors, to determine whether they have the cards to make a prime number each time.

You will need

- 2 to 4 players
- 1 Pack of cards per game
- List of prime numbers (optional)

How to play:

1. Shuffle the cards and deal 11 cards to each player, which they hold in their hand. The top card of the remainder of the pack is turned over and is the 'starting number'.
2. The player to the left of the dealer adds a card from their hand that adds to the starting card to equal a prime number.
3. The next player then tries to add to that total to equal a larger prime.
4. When a player can no longer add a card that sums up to a prime the hand is over, and the last person to make a prime gets a point.

Additional Rules: Ace = 1, Jack = 11, Queen = 12, King = 13
The first player to score 5 points is the winner

2. Multiplication: Product Hunt

This game enables pupils to practise the written method of multiplication in a more fun and motivational way than just working through calculations on a worksheet.

You will need

- 2 players
- 1 set of 0-9 Number Cards (use the number cards at the end of the pack)
- Pen and paper per player
- Stopwatch

How to play:

1. Shuffle the 0-9 digit cards and place in the middle of the table, face down.
2. Players take it in turns to take a card and place it face up on the table.
3. Continue until 5 cards have been selected in total.
4. Players then have 2 minutes to make as many long multiplication questions and calculate the answers as they can E.g. If the cards 2, 9, 5, 6 and 1 were chosen, they could write down the calculation 291 x 56.

The winner is the player with the most correct calculations completed in the 2 minutes.

3. Fractions, Decimals and Percentages: Snap

This game enables pupils to practise recognising equivalent fractions, decimals and percentages.

You will need

- 2 players
- 1 set of Fraction, Decimal and Percentage Cards (printable resource)

How to play:

1. Place the shuffled pile of cards face down on the table.
2. Take it in turns to turn over a card. If 2 cards are turned over with matching fraction / decimal / percentage E.g. 50% and ½, then the first player to call out 'snap' gets to keep all the cards put down so far.

The winner is the player at the end of the game with the most pairs of cards.

4. Multiplying / Dividing Fractions Game

This game can be used for both multiplying and dividing fractions, as well as comparing the size of 2 fractions. This game really gets pupils thinking, as they have to think carefully where to position their digits to make the largest fraction.

You will need

- 2 players
- 1 Multiplying Fractions sheet per player (printable resource)
- 1 Dividing Fractions sheet per player (printable resource)
- 1 Pen per player
- 1 Dice per game

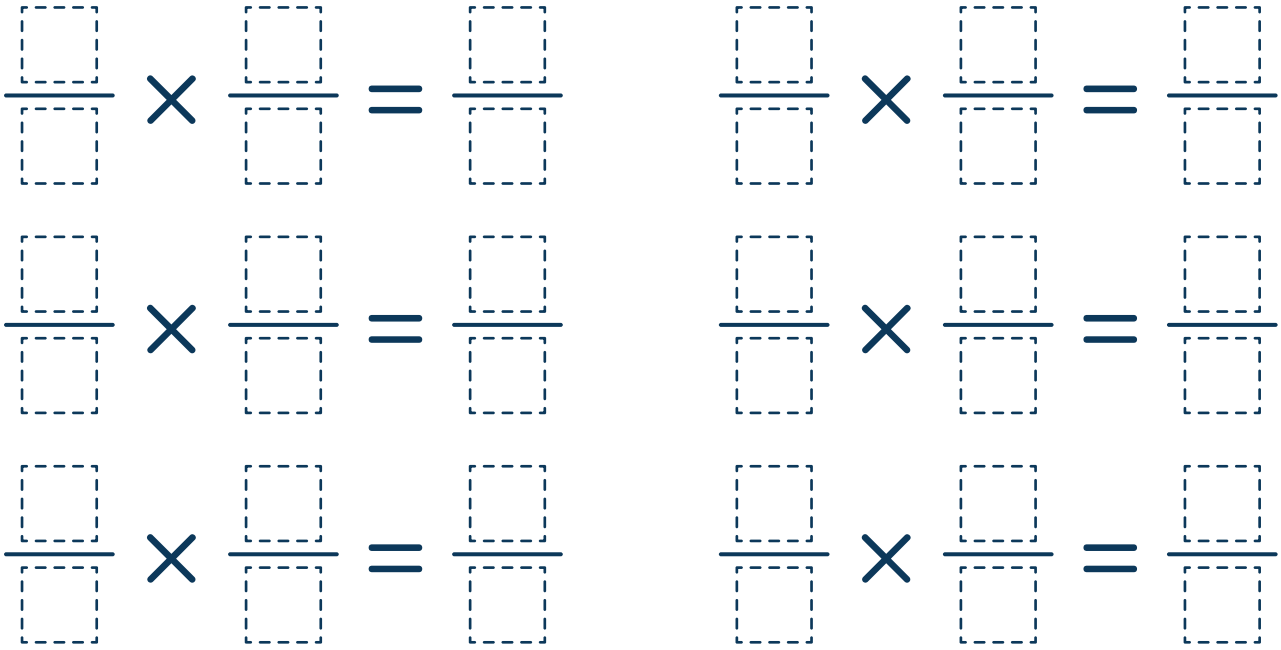
How to play:

1. Each player has a blank multiplying or dividing fractions page.
2. Take it in turns to throw the dice. Each player decides which box on their sheet to put the number in (if one player rolls a 4, both players write a 4 onto their sheet).
3. Once the numbers have been generated and all 4 boxes contain a number, each player multiplies / divides their fractions.

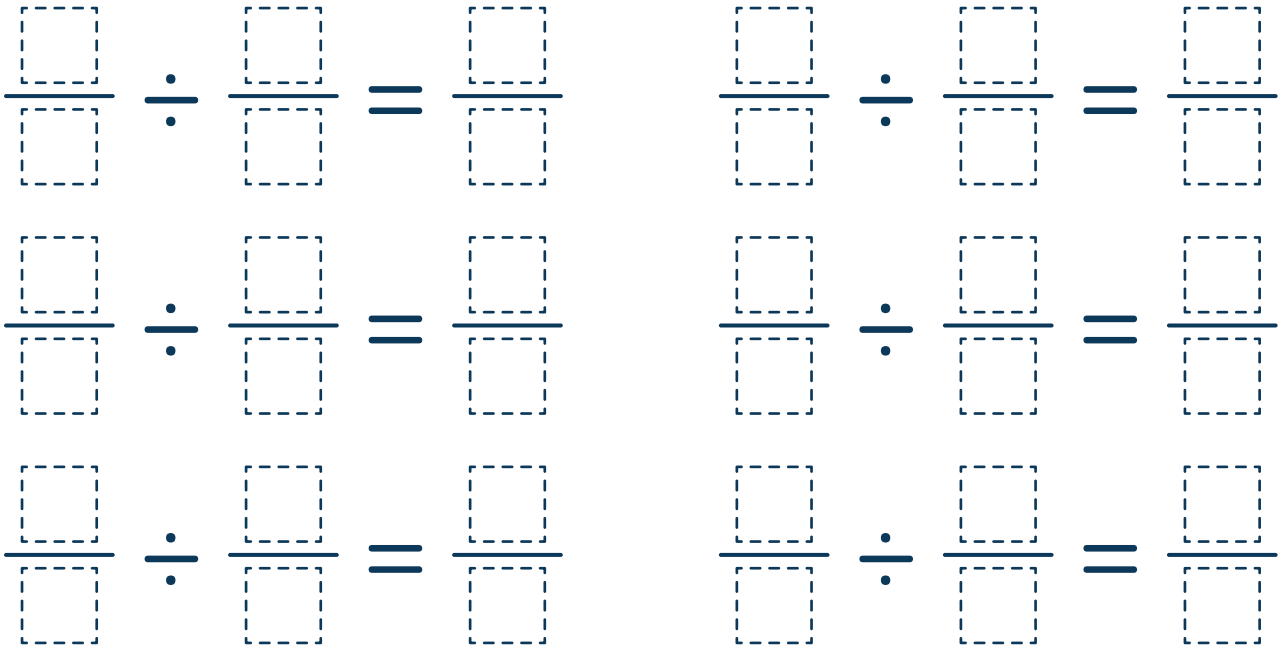
The player who has made the greatest fraction, when the 2 are multiplied or divided, scores 2 points.
If both players make the same sized fraction, each player scores 1 point.
The winner is the first player to reach 10 points.
Increase the difficulty by using two dice per game and adding the numbers on the dice together.

Printable Resource:

Multiplying Fractions



Dividing Fractions



5. Algebra Game: 3 In a Row

In Year 7, pupils build on the algebra skills learnt in Year 6 and start applying the skills that will take them through to GCSE. This game is a great way to practise algebraic expressions and more fun than simply answering questions from a textbook.

You will need

- 2 players
- 1 Algebra Game Board (printable resource)
- 2 Dice per game
- 1 Algebraic Expressions List (printable resource)
- 20 counters (2 colours)

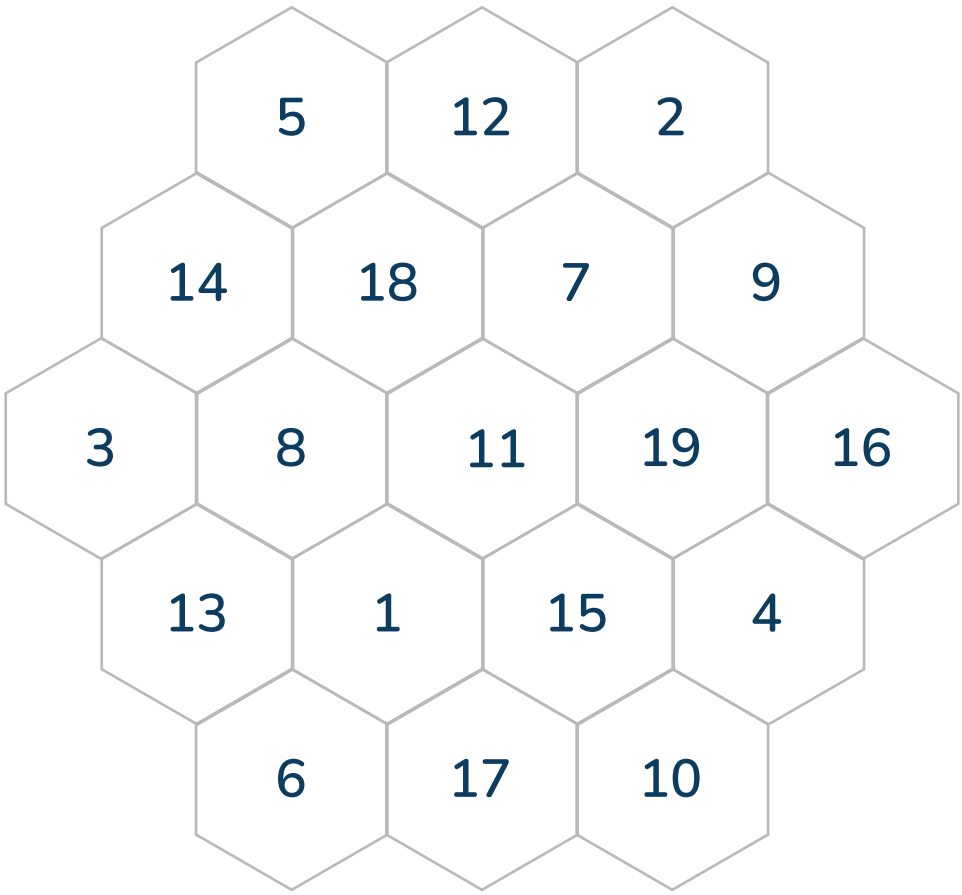
How to play:

1. The first player throws both dice.
2. This player uses the two numbers rolled to represent their a and b.
3. They then choose one of the 6 expressions and substitute their values for a and b into the expression.
4. They work out the answer and cover the number on the Algebra Game Board with a counter.
5. The next player repeats the process of rolling the dice and carrying out the substitution into one of the 6 expressions and then placing a counter on the answer.
6. Players continue to take it in turns.

The winner is the first player to position 3 counters in a row on the game board.

Printable Resource:

Algebra Game Board



Algebraic Expressions List

$2a + b$	$a + 2b$
$3a + b$	$b - 2a$
$2a - b$	$a \times b$

6. Coordinates Game: Battleships

In this game, players must identify all the coordinates of their opponent's battleships. It can be played using a 1 or a 4 quadrant grid and is great for practising the reading and plotting of coordinates.

You will need

- 2 players
- 1 Battleships Grid 1 or 2 for each player (printable resource)
- 1 Pen per player

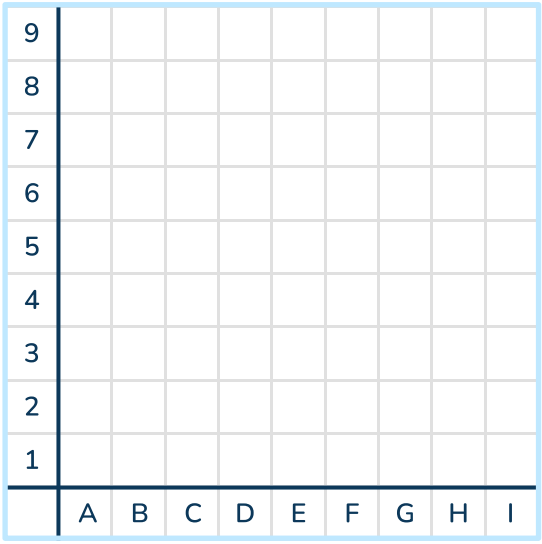
Additional Rules:
Battleships can only be placed horizontally and vertically (not diagonally)
If a battleship is 4 squares long, 4 squares in a line should be filled in on Battleships Grid 1, whilst 4 coordinates in a line should be crossed on Battleships Grid 2.

How to play:

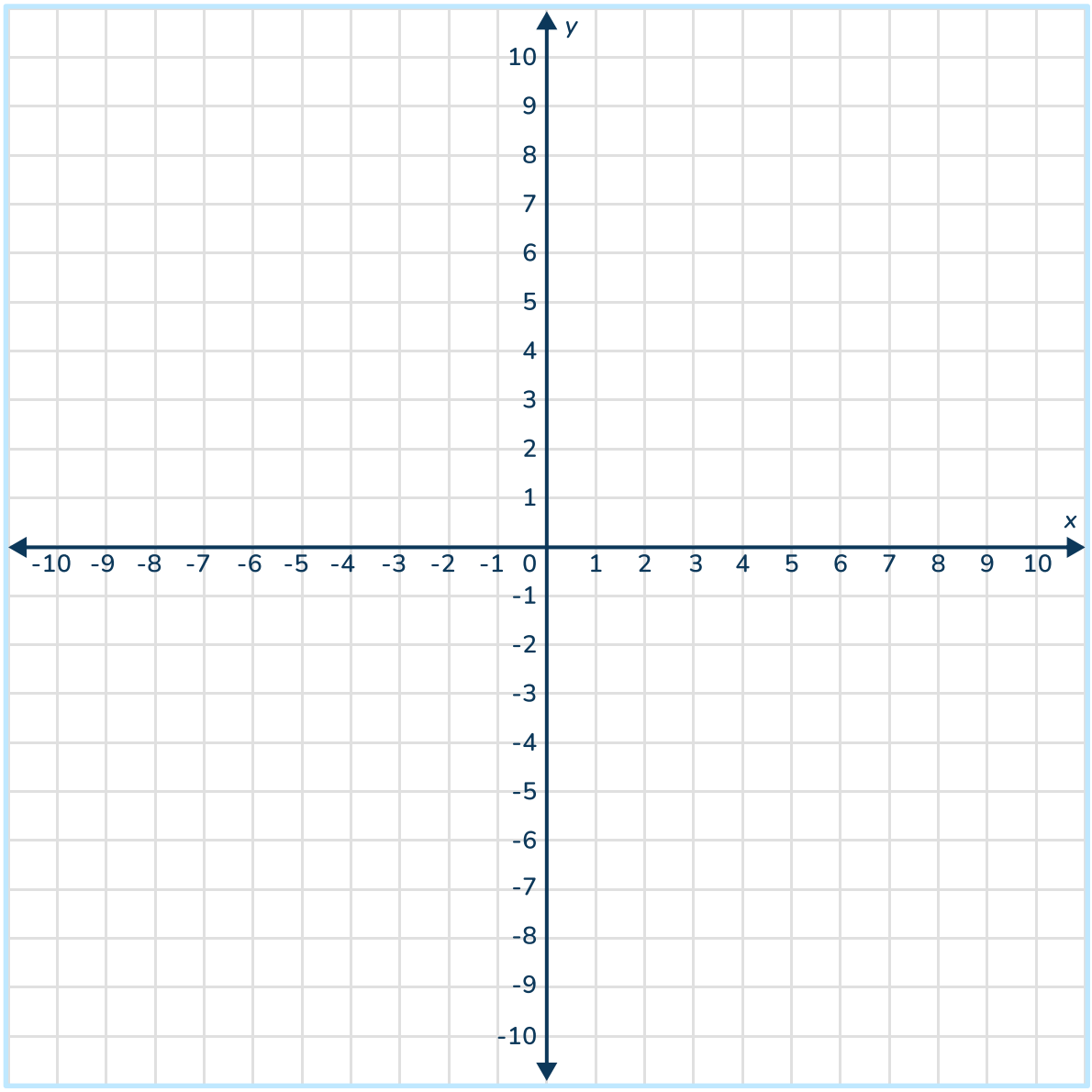
1. Decide on the number and size of the battleships you will play with. Each player marks the location of their battleships on their own grid, keeping it secret from the other player.
2. Player 1 calls out their first coordinate. If it hits one of the coordinates on player 2's grid, player 2 calls out 'hit' and player 1 marks it off. If it misses player 2's battleships, player 2 calls out 'miss' and player 1 marks it as a miss.
3. Players then swap over, so player 2 calls out their first coordinate. As before, player 1 calls out 'hit' or 'miss'.
4. Once a battleship has had all the coordinates called out, the player who's battleship it is shouts 'sunk'. The other player marks this on their grid.

The winner is the first person to sink all the other player's battleships.

Battleships Grid 1



Battleships Grid 2



Year 8 Games

By the end of Year 8, pupils should be increasingly fluent in making meaningful connections between different mathematical concepts and be able to apply them readily. Pupils should understand and solve a variety of algebraic equations, understanding how to manipulate expressions and equations fluently. The games in this section will enable pupils to practise the skills learnt both in Year 8 and in previous years.

7. Algebraic Expressions Game: Find the Operation

This game is a fun way to get pupils to practise working with algebraic expressions by substituting their own values whilst trying to identify their partner's expression.

You will need

- 2 players
- One 0 - 5 Algebra Grid per player (printable resource)
- 1 Pen

How to play:

1. Both players have a 0-5 grid, marked a and b.
2. Each player needs to decide on the rule for their grid. For example, $3a+b$ means multiply a by 3, then add b.
3. Once each player has decided on a rule for their grid, they complete 7 answers.
4. Players then swap grids and attempt to work out the other player's rule, then complete the rest of the grid.

The winner is the first player to correctly complete their opponent's grid.

Printable Resource

0 - 5 Algebra Grid

b \ a	0	1	2	3	4	5
0						
1						
2						
3						
4						
5						

8. Factors and Multiples Game

This game encourages pupils to focus on both factors and multiples, and gives pupils a valuable chance to practise their times tables.

You will need

- 2 players
- 1 Hundred square per game (printable resource)
- 2 Pens (different colours)

How to play:

1. The first player chooses a number on the hundred square and crosses it out.
2. The next player chooses a second number to cross out in a different colour. This number must be a factor or multiple of the first number.
3. Continue crossing out numbers, ensuring that each number crossed out is a factor or multiple of the previous number that has just been crossed out.
4. The first person who is unable to cross out a number loses and the other player earns one point.

The winner is the first player to get to five points.

Printable Resource

Hundred Square

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

9. Number Game: Yes / No

A game that can be used to get pupils to identify the basic properties of individual numbers (e.g. square number, multiple, factor). The pupil guessing has to prioritise which questions are going to enable them to get closer to the answer.

You will need

- 2 players or more
- 1 Number Game Board per player (printable resource)

Additional Rules:
Minimum of 3 rounds per game.

How to play:

1. Each player writes down a number in each of the 5 rounds for game 1, for the other player(s) to guess.
2. Player 1 asks a question about another player's number for Round 1 (e.g. is the number a multiple of 5?).
3. If the answer is 'yes', player 1 gets to ask another question.
4. If the answer is 'no', player 2 gets to ask a question.
5. The first player to correctly guess the other player's number wins the round and scores one point.
6. Repeat for each round.

The first player to score 3 points wins the game.

Printable Resource

Number Game Board

Game	Player __________________					Score
	Round 1	Round 2	Round 3	Round 4	Round 5	
1						
2						
3						

Game	Player __________________					Score
	Round 1	Round 2	Round 3	Round 4	Round 5	
1						
2						
3						

Game	Player __________________					Score
	Round 1	Round 2	Round 3	Round 4	Round 5	
1						
2						
3						

10. Division and Remainders Game: Mystery Number

In this game, pupils use a range of clues involving division and remainders to work out the mystery number.

You will need

- 2 player or more
- Pen and paper

How to play:

1. Both players think of a number between 1 and 100 for the other player to guess.
2. Player 1 gives a number between 2 and 10.
3. Player 2 works out what the remainder would be if their mystery number was divided by that number. E.g. player 2 may have chosen 44. If player 1 chose a 3 as their first number, then player 2 tells them what the remainder would be if their number was divided by 3. In this case, the remainder is 2.
4. Players jot down this information to help them work out the number once all the clues have been used.
5. Roles then swap and player 2 gives player 1 a number. Player 1 works out what the remainder would be if their number was divided by the number given by player 2.
6. This continues.

The winner is the first player to correctly identify the other player's number.

Year 9 Games

During Year 9, pupils continue to build upon the key skills from Year 7 and Year 8. This can be by following key procedures and formulae. The games in this section will practise these skills and enable them to practise other number skills learnt during their time in key stage 3.

11. Number Game: How Many Steps?

This game encourages pupils to look at multiple steps they can use to get from one number to another number. It also encourages the use of inverse operations / checking of calculations to check whether answers are correct – one of the most valuable maths skills they'll learn!

You will need

- 1 player or more
- Pen and paper

Additional Rules:
Determine the number of rounds for the game before starting to play.
The number of different steps used is the score
E.g. to get from 6 to 17:
6 (× 3) = 18 (+ 9) = 27 (+ 8) = 35 (÷ 5) = 7 (+ 10) = 17
This would score 5 points.

How to play:

1. Each player is given the same starting number and answer to use (e.g. starting number of 6, answer of 17).
2. Each player has 1 minute to write down the steps they would take to get from the starting number to the answer (here, 6 to 17).
3. Players can use any numbers they wish. Players are allowed to repeat an operation to get to an answer. E.g. for getting from 6 to 17, players can do 6 (+1) (+1)... etc. until they get to 17, but will only score 1 point as each step is the same.
4. Each player scores their number of different steps taken for each round.
5. Players are encouraged to check each other's answers and the steps taken. If any stage is incorrect, the player scores 0 points for that round.

The player with the most points after a given number of rounds played is the winner.

12. Number Game: Take Five

This is a number game to encourage pupils to think carefully about strategies needed to get an answer within a range of totals. The more individual numbers used to get an answer, the more points the player gets. Pupils need to decide whether a strategy of getting maximum points for each answer or using fewer numbers to get each answer is the best method.

You will need

- 1 or more players
- Pen and paper
- 4 sets of 1-10 Number Cards (use the number cards at the end of the pack)
- Stopwatch

Additional Rules:
Players can use each number once only.

How to play:

1. 5 numbers are selected at random from the shuffled set of number cards. A consecutive set of 10 answers is also agreed to work towards (e.g. 21-30, 41-50).

2. Players are given a 5-minute time limit to get the answers to as many of the totals as possible.

3. The more individual numbers used for an answer, the more points can be awarded. E.g. If the selected numbers were 9, 5, 2, 7, 1 and the totals were 21-30, 9+5+2+7+1=24 would score 5 points as all 5 numbers were used. 9 x (2+1) = 27 would score 3 points as 3 numbers were used. If a player has two of the same answer (eg: two methods for getting 23), whichever method uses more numbers is the points scored.

The first player to reach a total score of 20 wins.

13. Fractions Game: Countdown

This is a more challenging version of the standard, whole number game of countdown and requires players to carry out the 4 operations using fractions and whole numbers.

You will need

- 2 or more players
- 1 set of Whole Number and Fraction Cards (printable resource)
- 10-sided dice per game OR A set of 1-10 Number Cards (use the number cards at the end of the pack)
- Pen and paper
- Stopwatch

How to play:

1. Place the whole number and fraction cards into 2 piles.
2. Players take it in turns to select a card from the whole number or the fraction card pile.
3. Once 6 cards have been selected, place them face-up on the table.
4. A target number then needs to be generated (either using a 10-sided dice or 1-10 Number Cards to generate the numerator and denominator).
5. Players have 2 minutes to try and reach the target number using any of the 6 fraction / whole number cards and any of the 4 operations.

The winner is the first to reach the target number or the player who is closest after 2 minutes.

Printable Resource

Whole Number and Fraction Cards

1	2
3	4
$\frac{1}{2}$	$\frac{1}{4}$
$\frac{3}{4}$	$\frac{1}{8}$
$\frac{3}{8}$	$\frac{5}{8}$
$\frac{7}{8}$	

14. BIDMAS Game: 4 In a Row

This is a great game for practising the rules of BIDMAS alongside strategy skills. It can be played individually or against other players.

Additional Rules:
4 in a row can be horizontal, vertical or diagonal

You will need

- 1 or more players
- 4 Dice
- 1 1-50 Number Grid per game (printable resource)
- 2 Colouring pens (different colours)

How to play:

1. The first player throws the 4 dice to generate 4 numbers.
2. Using BIDMAS, they write a number sentence and colour in the square on the 1-50 grid, which contains their answer.
3. The next player does the same, colouring their answer on the same game board in a different colour.

The winner is the first player to colour in 4 squares in a row in the same colour.

Printable Resource:
1 to 50 grid

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

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

KS3 Mental Maths Games

Mental maths games are great for practising a range of mental maths concepts, whilst not requiring resources or time to set up. They can be used as a quick warm up at the start of a lesson, a fun way to consolidate learning at the end of a lesson, or as a mini-plenary.

15. Number Game: Nifty Fifty

This game is good for developing logical thinking and problem solving.

You will need

- 2 players
- 1 Pack of cards
- Stopwatch

Additional Rules:
Remove the 12 picture cards (KQJ) and the Jokers.
Ace = 1 etc.

To add further complexity to this game, you could give each player 6 cards and then add a 'wild' negative number card into the game which both players have to use in their round.

How to play:

1. Both players select 4 playing cards.
2. With the 4 cards, they have 2 minutes to make a 2-digit + 2-digit number sentence which is closest to 50.
3. The number sentence closest to 50 scores 1 point. If the player creates a calculation with exactly 50 as the answer, they earn 2 points.

The winner is the player with the most points after 5 rounds.

16. Subtraction Game: Sub-Zero

This is an easy and interactive mental subtraction game, which doesn't require any resources and is suitable to play when there are a spare few minutes.

You will need

- 2 to 4 players

Additional Rules:
The game can be played with a different starting number each time.
Players cannot subtract 0.

How to play:

1. Starting with a 3-digit number (e.g. 123), the first player chooses an amount to subtract. The number subtracted must contain one digit from the previous answer. E.g. the player could choose to subtract 22, so the new number would be 101.
2. The next player subtracts a new number from the current value (e.g. 11, so the new value is 90).
3. The next player continues to subtract a new number (e.g. 9).
4. The game continues.

The first player to get to zero is the winner.

17. Number Game: Countdown

This mental maths game is popular for any age. Younger pupils can access it on a more basic level, whereas older pupils can use more complex calculations. It works well in small groups, or as a whole class activity, and encourages players to think deeply to identify calculations that will get them to the target number.

You will need

- 2 or more players
- 1 set of Countdown Cards (printable resource)
- 2 sets of 0-9 Number Cards (use the number cards at the end of the pack)
- Stopwatch

Additional Rules:
Include the small blank (wild) card for pupils to choose their own single digit number.
Number cards can only be used once.

How to play:

1. Set out the large and small number cards face down on a desk and place the 2 sets of shuffled 0-9 digit cards in a separate pile.
2. Players take it in turns to choose a total of 6 small and large numbers from the desk and turn them face up on the table.
3. The target number is then generated by picking 3 number cards from the pile of 0-9 cards.
4. Pupils now have 2 minutes to try and reach that total using the 6 cards selected.
5. Pupils can use any calculation using the 6 numbers, but each number can only be used once.

The winner is the first person to reach the target number or the person to have the closest answer after 2 minutes.

Printable Resource:
Countdown Cards

1	1	2
2	3	3
4	4	5
5	6	6
7	7	8
8	9	9
10	10	

25	50
75	100

18. Number Game: Target 24

This game is a great problem solving and 'low floor, high ceiling game', as players search for a solution. They can use only the basic calculations to reach the target number, or they can utilise much more complex mathematical calculations.

You will need

- 2 or more players
- 1 Pack of cards
- Stopwatch

Additional Rules:
Remove the 12 picture cards (King, Queen, Jack) and the Jokers.

How to play:

1. Shuffle the pack of cards and lay the pile face down on the table.
2. Each player picks a card and turns it face-up on the table until there are 4 cards displayed.
3. The aim of the game is to make '24' using only the cards on the table and any of the 4 operations. E.g. if they have a 6, 10, 2 and 6, the solution could be very simple: 6 + 10 + 2 + 6 = 24. More able players may include more complex operations involving brackets, e.g. 9, 5, 6 and 9 can become 5 – (9 ÷ 9) x 6 = 24.

The winner is the player who reaches 24 first, or after a given time limit gets the closest to 24.

19. Number Game: Wild Jack

This is another great game for practising mental maths and numeracy skills using all four operations.

You will need

- 2 or more players
- 1 pack of cards

Additional Rules:
Remove the Kings, Queens and the Jokers.
Jacks are wild and so they represent any number from 1 - 10. Ace = 1 etc.
If a target number is reached using all 5 cards, 10 points are scored. If 4 cards are used, 8 points are scored and so on.

How to play:

1. Shuffle the pack and turn over the top 2 cards to make the target number (e.g. 6 and 4 makes the target number 64). If either card is a 10 or Jack, put them to the bottom.
2. Each player is then dealt 5 cards, set out face up.
3. Players can then add, subtract, multiply and divide their cards to try to reach the target number.

The winner is the player with the most points at the end of the game.

KS3 Problem Solving Games

Problem-solving games are a great way for pupils to deepen their mathematical understanding. These games require pupils to think strategically and to approach problems in different ways.

20. Number Game: Game of Six

This is a number game to encourage pupils to think carefully about strategies needed to get an answer within a range of totals. The more individual numbers used to get an answer, the more points the player gets. Pupils need to decide whether a strategy of getting maximum points for each answer or using fewer numbers to get each answer is the best method.

You will need

- 1 or more players
- 1 pack of cards
- Pen and paper
- Stopwatch

Additional Rules:
Ace = 1, Jack = 11, Queen = 12, King = 13.
Players can only use each number once only.

How to play:

1. 6 numbers are selected at random from the shuffled pack of cards. A consecutive set of 10 answers is also agreed to work towards (e.g. 21-30, 41-50).
2. Players are given a 5-minute time limit to get the answers to as many of the totals as possible.
3. The more individual numbers used for an answer, the more points can be awarded. E.g. If the selected numbers were 4, 8, 6, 3, 5, 9 and the totals were 31-40, (4 x 8) - (6 - 5) = 31 would score 4 points as 4 numbers were used. (4 x 9) + ((8 + 3) ÷ (6+5)) would score 6 points as all 6 numbers were used. If a player has two of the same answer (eg: two methods for getting 35), whichever method uses more numbers is the points scored.

The first player to reach a total score of 20 wins.

21. Number Game: 5 of a Kind

This problem-solving game is quite a challenging maths activity. It requires players to think deeply about the calculations they use and how they can use quite complex calculations to achieve solutions.

You will need

- 2 or more players
- A set of 2-9 Number Cards (use the number cards at the end of the pack)

How to play:

1. Shuffle the number cards and place them face down on the table.
2. The first player picks one of the cards. This is their '5 of a kind' number. E.g. if they selected a 6, they would have 6, 6, 6, 6 and 6 to use.
3. Using one or more of the 5 digits, get an answer between one and ten. E.g. if the player chose a 7, to make 1 they could do $7 \div 7$, to make 2 they could do $(7 \div 7) + (7 \div 7)$ etc.

The winner is the player to achieve the most answers between 1 and 10.

22. Addition Game: Got It

This is a great strategy game and with no set up required, it's easy to play at any time. It involves adding, but players need to think carefully about the strategy they use and whether they are able to find a winning strategy.

You will need

- 2 players

Additional Rules:
The target number for the game is always 23 (optional) so that players can think about their strategy and plan ahead.

How to play:

1. The first player chooses a number from 1 to 4.
2. Players take turns to add a whole number from 1 to 4 to the running total.

The player who lands on 23 wins the game.

23. 2-D Shapes Game: Square It

This is another good strategy game, not only requiring players to think about their own game but also that of the other player's.

Additional Rules:
Players can steal squares from the other player by marking the fourth dot / corner.

You will need

- 2 players
- Square dot paper
- 2 coloured pens (different colours)
- Stopwatch

How to play:

1. The first player places a coloured dot on one of the dots on the squared paper.
2. The second player does the same, using a different colour pen.
3. This continues until one of the players has placed 4 dots which can be joined together to form a square.
4. The square can be any size on the grid and can also be tilted.

The winner is the player who either creates the most squares within a given time or creates the square with the longest side length.

24. 3D Shapes Game: Nine Colours

This is a fun game and challenging activity, similar to playing with a Rubik's cube.

You will need

- 1 or more players
- 27 cubes (3 each of 9 colours) per player

Additional Rules:
This game can be played individually, or as a speed challenge against other players.
If any face contains more than one of the same colour cube, the player hasn't successfully completed the challenge.

How to play:

1. Each player needs to make a large cube using the 27 small cubes (3x3x3).
2. Each of the 6 faces of the large cube must contain 9 different coloured squares.

The winner is the first player to complete the challenge.

0 - 10 Number Cards

0	1	2	3
4	5	6	7
8	9	10	

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