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AIMING HIGH

Mathematics for everyone!

Let's Play Book for Teachers Links and Downloads



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Let's Play To Learn Mathematics



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AIMING HIGH

Mathematics for everyone!

<https://www.tarquingroup.com/products/aiming-high-lets-play-mathematically/>

Introducing 2 books

THE BOOK FOR FAMILIES
has mathematical games for families to play at home with ideas about strategies and related mathematics.



THE BOOK FOR TEACHERS
has games for all age groups, curriculum links, learning resources and suggestions for teaching.

Let's Play to Learn Mathematics Teacher' Guide has 44 sets of games with many different versions of the games for different age groups from kindergarten to leaving school. The books help teachers to put research findings about the Pedagogy of Playful Learning into practice in schools.

Project Zero Research <https://pz.harvard.edu/>
<https://pz.harvard.edu/resources/pedagogy-of-play-book>

Some of the games and learning activities in this book have been adapted from NRICH tasks with permission of the NRICH project at the University of Cambridge (<https://nrich.maths.org>). All rights reserved.

GAMES LINKS, RELATED CURRICULUM DOWNLOADS

FOLLOW UP & RESOURCES

SECTION 1 NUMBER (includes pre-algebraic thinking for young learners)

N1. Spin High Low & Less is More <i>Place value, inequalities</i> Spin High Spin Low Game Download The Spin High Spin Low Poster. Less Is More on NRICH More Less Is More on NRICH	Watch the CPD video Let's Play Mathematically Problems involving inequalities suitable for Upper Secondary. Farey Sequences Almost Total Inequality
N2. Target Games Collection <i>Calculation methods for whole numbers and algebra</i> Target Game Collection Download the Target Game Collection Poster	Watch the CPD video Target Games
N3. Integers Games <i>Calculations with integers</i> Target Game with Integers Cards for Target Game with Integers Download The Target Game of Integers Poster	Wikipedia article on Negative Numbers Follow-up: Extremes
N4. Tug of War	Watch the CPD video What are Numbers?

Number line, calculations with integers Tug of War Game++ Strip to Play Tug of War on. Download The Tug of War Poster	
N5. Divisibility Factors, Exponents, Prime factorisation. Divisibility Game Divisibility Gameboard. Download The Divisibility Game Poster	Watch the CPD video How Many Factors Guide for a CPD workshop on: The Meaning of Division Article by Tim Rowland Tests For Divisibility Follow-up Prime Sieve Exponents Powerful Thinking 1, 2, 3 and 4
N6. Checkit Games Collection Calculations and Binary operations, including algebra Checkit Game Checkit Starter Games for 2 Players or Teams Poster Checkit Game – 4 Operations and Inverses Tailor Your Own Checkit Poster Checkit Game Quadratic Factorisation Poster. Checkit Match Letters Poster	Watch the CPD video Combining 3 numbers -Polycircles, Triangle Midpoints and Checkit. Polycircles Triangle Midpoints
N7. Fraction Wall Games Comparison of fractions. Calculations with fractions Fraction Wall Games Selection of Fraction Walls Algebraic Fraction Wall Download The Fraction Wall 1 in 10 Game Poster.	Follow-up: Primary Chocolate Fractions Fractions By Halves Fractions By Thirds Tangram Fractions Lower Secondary Divide Divide Repetition Egyptian Fractions The Greedy Algorithm Upper Secondary Peaches GP Algebraically GP Geometrically
N8. FDP Pelmathism Fractions, Decimals and Percentages Pelmathism Game Sets Of Cards for FDPI Pelmathism Pelmathism Poster Download Sheets of Cards, Print onto Card and Cut Out. • Blank Cards To Make Your Own Game • One To Eight Memory Game For Early Years • Addition Memory Game For Lower Primary • Game 1 FI - Fractions and Images • Game 2 FD - Fractions and Decimals • Game 3 DI - Decimals and Images • Game 4 FP - Fractions and Percentages • Game 5 FI - Percentages and Images • Game 6 DP - Decimals and Percentages • Game 7 FDPI - Fractions, Decimals, Percentages and Images	Guide for a CPD workshop on: Fractions, Decimals and Percentages
N9. Telling the Time Pelmathism Telling the Time 4 sets of cards showing time in different ways. Telling The Time- Card Matching & Pelmathism Poster	Guide for a CPD Workshop on: Time Time 1 Time 2 Time 3
N10. Exponents Pelmathism Exponents (powers or indices) Exponents, Card Matching and Pelmathism Exponents Card Set Exponents Poster	Guide for a CPD Workshop on: Exponents and Surds Power Matching Download The Power Matching Puzzle Poster. Powerful Thinking 1 2 3 4 Powerful Numbers Poster
N11. Mathgo + - $\times$ $\div$ of numbers 1 to 6. Strategic thinking. Mathgo	

Download The Mathgo Poster.	
Fifteen Game <i>Addition numbers 1 to 9. Strategic thinking. Isomorphism.</i> Fifteen Game Collection Download the Fifteen Game Poster	Watch the CPD video Fifteen Game Collection
Magic Square <i>Addition numbers 1 to 9. Strategic thinking. Visualisation</i> Magic Square Game Download The Magic Square Game Poster	Download The Magic and Unmagic Squares Puzzles Poster See also Durer's Magic Square
Laflot <i>Word game. Strategic thinking. Isomorphism.</i> Laflot Game Laflot Cards Laflot Poster	
Siege <i>Addition numbers 1 to 9. Strategic thinking. Visualisation</i> Siege Game Siege Game Map Download the Siege Game Poster	
Ultimate Tic Tac Toe <i>Game of strategy. Nine games played simultaneously.</i> Ultimate Tic Tac Toe Game Download The Ultimate Tic Tac Toe Poster	

SECTION 2 ALGEBRA AND CALCULUS

A1. Frogs Games <i>Number patterns. Finding formula defining sequences.</i> Frogs Game Cards, Tribar and Triangles for Frogs Game Find The Frogs Formula Poster	Guide for a CPD workshop on: Sequences and Patterns Equipattern Squares Pattern
A2. Groups Games <i>Reading information from tables. Groups. Transformations</i> Groups Games Download The Gameboards and Key-Tables Download The Groups Games Poster.	Watch the CPD video What are Numbers?
A3. Functions Game <i>Functions and inverse functions.</i> The Function Game Functions Game Poster	Shifting Times Tables Mind Reader Steps Building Functions Undoing
A4. Algebrarea Puzzle and Game <i>Factorising quadratic expressions. Graphs</i> Algebrarea Game Algebrarea Starter Jigsaw Algebrarea Puzzle Pieces Download The Algebrarea Poster.	Guide for a CPD workshop on: Developing Algebraic Skills Watch the CPD video Quadratic Functions The Quadratic Matching Cards and Game have been adapted from the STANDARDS UNIT professional development materials produced by the UK Department for Education and Skills. Author Malcolm Swan
A5. Multiple Representations Pelmathism <i>Multiple representations of algebraic functions. Graphs.</i> Multiple Representations Small cards Big Cards Record Sheet Download The Multiple Representations Poster.	Lines Quadratic Matching 1 Quadratic Matching 2 Quadratic Functions Matching Exponentials Matching Hyperbolas Transformation of Functions
A6 Derivatives Pelmathism Functions and derivatives Derivative Card Matching & Pelmathism Cards For Derivative Matching Derivative Card Matching & Pelmathism Poster	D'rivng

SECTION 3 GEOMETRY

G1. Squares <i>Properties of squares, area, angles.</i> Squares Game More grids to play on. Download a sheet of 3 by 3 grids or 4 by 4 or 5 by 5 grids . Download the Squares Game poster.	Watch the CPD video Squares Games, Puzzles and Pythagoras Theorem Play against the computer on NRICH How Many Squares?
G2. Rollover <i>Visualisation. Rotations in 3D.</i> Rollover Game Rollover tiles and net for Tetrahedral Dice Rollover Games Poster.	
G3. Polystars <i>Latin Squares and combinatorics. Regular polygons.</i> Polystars Game Download The Polystars Gameboards and Pieces Polystars Poster.	Teddy Town on NRICH
G4. Polypath <i>Recognising 2D and 3D shapes</i> Polypath Gameboards and prompt sheet.	Making Triangles leads to Tet Trouble Dodecamagic
G5. Mystic Rose <i>Visualisation.</i> Mystic Rose Game Download The Mystic Rose Game Poster.	Watch the CPD video Path to the Stars Path to the Stars learning activity.
G6. Vectors <i>Moving on a torus according to 2D vectors.</i> Vectors Game Download the gameboard and rules. Download The Vectors Game Poster	
G7. L Game <i>Reflections, rotations and trapping the opponent.</i> L Game Game Board and Game Pieces for The L Game Download The L GAME Poster.	Wikipedia Article L Game Edward de Bono invented the L game. See his videos, for example How to have a Beautiful Mind .

SECTION 4 PROBABILITY AND STATISTICS

P1. Horserace Game <i>First introduction to probability and contingency tables.</i> Horse Race Game Download the Horse Race gameboard Download The Horserace Game Poster.	Guide for a CPD workshop on: Contingency Tables and Venn Diagrams
P2. Sum Difference Game <i>Counting events in a sample space, probabilities 2 events.</i> Sum Difference Game Download The Sum Difference Games Poster	
P3. Game of Pig <i>Addition and subtraction. Estimating probabilities</i> Game of Pig Download a Gameboard Game of Pig Poster.	
P4. Red or Black <i>Easy game. Mainly luck. Some probability involved.</i> Red or Black Game Red or Black Game Poster.	
P5. Odds and Colours Games <i>Contingency tables. Fair games conditions. Isomorphism.</i> Odds and Colours Games Download The Isomorphic Games Poster.	Guide for CPD workshop on: Problems Leading to Series Watch the CPD video Odds & Evens, Red & Blue Games Run 100 Trials of Odds and Evens Game Online at NRICH

P6. Rock Scissors Paper <i>Extensions to 5 & 7 actions. Contingency tables and cycles.</i> Rock Scissors Paper Game Rock Scissors Paper 5 And 7 Elements Networks. Rock Scissors Paper Poster	Guide for CPD workshop on: Probability and Tree Diagrams Contingency Tables and Venn Diagrams Watch the CPD video Trees, Contingency Tables and Venn Diagrams
P7. Lucky Numbers <i>Tree diagrams and calculating probabilities.</i> Lucky Numbers Game Download The Lucky Numbers Games Poster	Guide to CPD video on: Watch the CPD video Lucky Numbers and Lotteries
P8. Mathopia Lottery <i>Tree diagrams, probabilities simulating National Lotteries</i> Mathopia Lottery Game Download Cards for The Mathopia Lottery Download The Mathopia Lottery Game Poster.	More learning activities involving tree diagrams: Same Sweets Same Birth Month Same Birthday Epidemic
P9. Mean Median Mode Game <i>Averages.</i> Mean Median Mode Game Download the M, M and M Game poster	Watch the CPD video Mean Median and Mode For a variant see Unequal Averages on NRICH

SECTION 5 GAMES FOR CLUBS

C1. Draw and Talk <i>Visualisation, communication and enrichment.</i> Draw and Talk Game Download the cards to print, cut out and to play the game. Draw and Talk poster	
C2. Five in a Line <i>Game of strategy.</i> Five in a Line Game Download the Five in a Line worksheet and gameboard Download The Five In A Line Poster.	
C3. Nine Men's Morris <i>Game of strategy, blocking opponent & capturing pieces.</i> Nine Mens Morris Game Gameboards For Nine Mens Morris Download The Nine Mens Morris Poster.	Wikipedia article Nine Mens Morris Toy Theatre Games Collection
C4. Seega <i>Game of strategy, blocking opponent & capturing pieces.</i> Seega Gameboards for Seega, Jump and Derrah Seega Poster	Wikipedia article Seega Game
C5. Senet <i>Game of strategy from Ancient Egypt. Blocking opponent</i> Senet Download a Senet Gameboard and Game Pieces. Download The Senet Poster.	The Rammuseum Make and Play Senet Raven's table You Tube History and Rules for SENET
C6. Nim games <i>Game of strategy analysed using binary arithmetic.</i> Nim Games Download The Nim Games Poster.	Article explaining how binary numbers are the key to winning Nim Games Play to Win with Nim

MORE GAMES & RESOURCES

Factors and Multiples <i>Factors and multiples</i> Factors and Multiple Game Download The Factors and Multiples Game Poster	Watch the CPD video How Many Factors? Prime Sieve How Many Factors? Loading Lorries Magic of 37
In a Box game <i>Contingency tables. Fair games conditions. Isomorphism.</i> In a Box Game Download The In a Box Game Poster.	
Blocks game <i>Cuboids. Volume</i>	Watch the CPD video Volume and Capacity Cuboids and Smallest Surface Area Cuboids and Roots

Blocks Bricks and Boxes Game Download The Blocks Game Poster	Same Volume Maxbox
Tangram Fractions game Fractions Tangram Fractions Game Tangram Fractions Poster	Watch the CPD video Tangram Geometry Tangram Shapes Tangram Pattern Magic Egg Tangram Puzzle
The Mathematical Playground MATHIGON Julia Robinson MATHEMATICS FESTIVAL Wikipedia HISTORY OF GAMES MacTutor HISTORY OF MATHEMATICS MacTutor Biography of Edouard Lucas	Online Dice Roller Wikipedia LIST OF DICE GAMES