DIVISION IV (GRADES 6-7)
Mathematics Pentathlon® Games & Essential Resources

PRIME GOLD™

The four basic operations, exponentiation, factorials, algebraic thinking, and prime and composite numbers are integrated in this strategy-chance alignment game. The gameboard represents a grid with numerical values that sequentially spiral from the board's center to the outer band which results in prime numbers that occur along diagonal lines. For each play students form number sentences based on the roll of 3 polyhedra dice and place chips on corresponding numbered spaces of the gameboard. The structural/numerical arrangement of the gameboard relates to one of the games goals: constructing 4 diagonal veins of prime gold. Blocking rules dealing with prime and composite numbers, multiple chip placement based on Goldbach's conjecture, and a second game goal make this a most challenging computational reasoning game.

REMAINDER ISLANDS™

Polyhedra dice, pawns, chips and a hexagonal-triangular shaped gameboard are used to play this strategy-chance division game. The goal is to place the greatest number of chips on the board's six hexagonal-shaped islands. A series of rules related to zero remainders and networking pawns along strategic pathways make this both a conceptual and problem-solving game.

PENT 'EM IN™

This transformational geometry game develops spatial visualization as well as both deductive and inductive reasoning. Each player uses 5 pentominoes (chosen from a set of 12 pieces) and two blocking chips on a 13 by 9 grid to entrap all 5 of the opponent's pentominoes. In the placement phase players must strategically select and place five pentomino pieces onto the gameboard. In the movement phase players attempt to entrap the opposing player's five pentominoes by rotating, flipping, or sliding their own pieces.

FRAC FACT™

Equivalence, the four basic operations as well as algebraic principles are investigated in this conceptual and strategic fraction game. A set of 64 fraction bars that pictorially represent various fraction values are used to help students connect symbolic procedures with visual models. On each turn students try to find two bars that when combined through the four basic operations equal one of the answer bars on the specially designed gameboard. Students must use strategic thinking skills when examining all possible combinations of bars and operations as well as setting up moves for future options.

FRACTION PINBALL™

The gameboard and game pieces in this fraction-decimal conversion game simulate the ricocheting action of pinballs in a pinball machine. In playing this game students must strategically position and move pawns and blocking chips to land on fraction values of the gameboard which are converted to decimal form and are added to or subtracted from an accumulated score. The goal of the game is to be the first player to reach an accumulated score of <u>between</u> 4.95 and 5.05. Since the gameboard is composed of a network of interconnected fraction circles, students must use both spatial and computational reasoning when making decisions.

The Guide for Teaching & Sequencing the Mathematics Pentathlon® Program for Division IV (Grades 6-7): This step-by-step Program Guide of Math Pentathlon lessons provides effective and detailed guidance to adults who are teaching the Math Pentathlon Program at their school. The Guide is organized into monthly lesson plans with 4 lessons per month for weekly implementation.

Adventures in Problem Solving Activity Book II (Grades 4-7): This publication connects the games with ongoing classroom and club instruction. Prerequisite skills for playing the games as well as many other problem-solving activities are described in a user-friendly format.

Investigation Exercises Book II (Grades 4-7): These problem-solving worksheets develop a more analytic focus and greater insight into the multiple strategies of each game.

MATH CONTENT & STANDARDS: MATHEMATICS PENTATHLON® PROGRAM
(The Games, Adventures in Problem Solving, and Investigations Exercises)
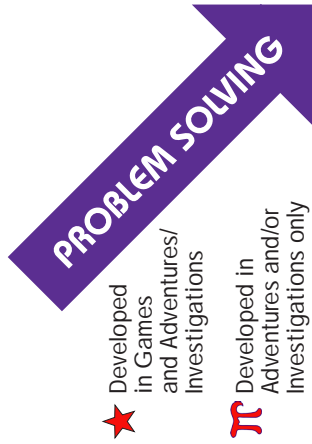
Legend:
- ★ = Developed in Games and Adventures/Investigations
- π = Developed in Adventures and/or Investigations only

Major content areas (column groups): **PROBLEM SOLVING**, **COMPUTATIONAL REASONING**, **LOGICAL/SCIENTIFIC REASONING**, **SPATIAL/GEOMETRIC REASONING**

Div	#	Game	Problem Solving	Counting	Number Sense	Algebra	Number/Numeral Recognition	One-to-One Correspondence	Equality	Inequality	Addition	Subtraction	Multiplication	Division	Fractions	Decimals	Measurement	Prime & Composite or Odd & Even Numbers	Exponentiation	Factorials	Probability	Observation	Classification	Communication	Patterning	Hypothesizing & Experimentation	Deductive Reasoning	Inductive Reasoning	Number Theory	Combinatorics	Geometric Figures & Regions	Directionality	Topology	Networks	Structural Analysis of Space	Symmetry & Reflections	Congruence	Similarity	Area	Transformational Geometry
I	1	Kings & Quadraphages™	★	★	★	★		★	★	★												★	π	★	★	★	★	★		★	★	★	★		★	★			★	
I	2	Calla™	★	★	★	★	π		★	★	★											★		★	★	★	★	★		★		★								
I	3	Hex-A-Gone!™	★	★	π	★			★	★	★				★		★					★	★	★	★	★	★	★	★	★		π			★	★	★	★	★	★
I	4	Shape-Up™	★	★	★	★			★	★	★											★	★	★	★	★	★	★		★		★			★	★	★	★		★
I	5	Star Track™	★	★	★		★		★	★	★	★					★				★	★	★	★	★	★	★	★		★		★			★					
II	6	FIAR™	★	★	π		π		π													★								★		★	★	★	★	π	π	π	★	π
II	7	Sum Dominoes & Dice™	★		★	★	π		★	★	★	★									★	★		★	★	★	★	★		★		★	★	★	★					
II	8	Ramrod™	★	π	★	★			★	π	★	★					★					★		★	★	★	★	★	π	★	★	★	★	★	★	π		★	★	π
II	9	PAR 55™	★		★	★			★	★	★	★										★	★	★	★	★	★	★		★	★	★		★	★					
II	10	Kwatro-Sinko™	★	π	π				π	π	★	★						★				★		★	★	★	★	★		★		★	★	★	★	π			★	π
III	11	Contig 60™	★		★	★			π	★	★	★	★	★							★	★		★	★	★	★	★	★	★		★	★		★	★	★			
III	12	Juggle™	★	★		π			π	π	★	★	★	★			★				★	★	★	★	★	★	★	★		★	★	★	★		★	★	★		★	★
III	13	Stars & Bars™	★			★			★	★	★		★									★		★	★	★	★	★		★		★			★			★		
III	14	Queens & Guards™	★		★						★				★						★	★		★	★	★	★	★		★	★	★			★					
III	15	Fab-A-Diffy™	★			★			★	★	★	★	★	★								★		★	★	★	★	★		★	★	★			★				★	
IV	16	Remainder Islands™	★		π	★					★	★	★	★							★	★		★	★	★	★	★		★	★	★	★	★	★					
IV	17	Prime Gold™	★	★						★	★	★	★	★	★			★	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★		★					
IV	18	Pent 'Em In™	★		★	★			★		★	★	★	★	★						★	★	★	★	★	★	★	★		★	★	★	★	★	★	★	★	★	★	★
IV	19	Frac Fact™	★		★	★					★	★	★	★	★							★		★	★	★	★	★		★	★	★			★				★	
IV	20	Fraction Pinball™	★						★		★	★	★	★	★	★						★		★	★	★	★	★		★	★	★		★	★					