DIVISION II (GRADES 2-3)
Mathematics Pentathlon® Games & Essential Resources

SUM DOMINOES & DICE™
The missing addend model of subtraction, sums and differences through eighteen, algebraic thinking, spatial visualization, and deductive reasoning are concepts/skills that students experience while playing the game of Sum Dominoes & Dice. In this strategy-chance game students search for domino faces in their hands that when attached to faces of dominoes on the gameboard equal the sum that they roll for each turn. The ability to see many different combinations for each dice-roll sum enables students to get rid of all dominoes in their hand (the goal).

PAR 55™
This game uses attribute logic blocks to develop students' multiple classification skills, algebraic thinking, and logical and computational reasoning. The gameboard is comprised of connected pentagon bases upon which students place attribute blocks that are connected to other blocks. Whenever a "placed block" is connected to an occupied base, points are scored based on four attributes: shape, color, size, and thickness. The networking of gameboard bases, the potential for a "placed block" to be connected to multiple bases, and bump rules create a critical thinking game that challenges a broad grade and ability range.

RAMROD™
The game of Ramrod combines the ability to know all facts for each number family with strategic thinking. Cuisenaire rods and a gameboard that connects rectangular (sum) boxes composed of different metric lengths provide the setting for students' active investigation of addition and subtraction, measurement, algebraic thinking, estimation, spatial reasoning, and inductive and deductive thought. In this game students must plan ahead to construct "RAMROD" (addend) combinations of two rods that complete a rectangular (sum) box length in the playing area of the gameboard. Such (addend) combinations result in captures that relate to the game goal of being the first to complete their 24 cm rectangular region of the gameboard. The ability to associate each of the colored rods with their corresponding number value facilitates students' skill to mentally compute all of the facts for each number family represented on the gameboard.

KWATRO-SINKO™
Computational and spatial reasoning as well as algebraic thinking are required in this alignment game where chips are moved along the gameboard's connected horizontal, vertical, and diagonal pathways. One player has five even-numbered chips and the other, five odd-numbered chips. The goal of the game is to create a spatial and numerical alignment which results in an answer of four or five. To play this game effectively students must know many number sentence combinations of adding two even chips and subtracting an odd numbered chip (or vise-versa) to get an answer of four or five.

FIAR™
This alignment game requires students to use spatial reasoning and observation skills to visualize many possible options for moving chips along the gameboard's connected horizontal, vertical, and diagonal pathways. While the rules to this game are simple, development of strategies to set up structural situations that construct winning paths and block opponent's paths are quite challenging.

The Guide for Teaching & Sequencing the Mathematics Pentathlon® Program for Division II (Grades 2-3):
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 I (K-3):
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 I (K-3):
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

Problem Solving & Computational 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
I	1	Kings & Quadraphages™	★	★	★	★		★	★	★											
I	2	Calla™	★	★	★	★	π	★	★	★											
I	3	Hex-A-Gone!™	★	★	★	★		★	★		★				★		★				
I	4	Shape-Up™	★	★	★	★			★		★	★									★
I	5	Star Track™	★	★	★		★				★						★				★
II	6	FIAR™	★	★	π		π		π	★	★										★
II	7	Sum Dominoes & Dice™	★	π	★	★	π		★		★	★									
II	8	Ramrod™	★	π	★	★			★		★	★					★				
II	9	PAR 55™	★		★						★	★									
II	10	Kwatro-Sinko™	★						π	π								★			
III	11	Contig 60™	★	★	π	★	★		π	★	★	★	★	★							★
III	12	Juggle™	★		π	π			★	π	★	★	★	★			★				★
III	13	Stars & Bars™	★			★				★			★								
III	14	Queens & Guards™	★		★				★												
III	15	Fab-A-Diffy™	★			★									★						★
IV	16	Remainder Islands™	★						★		★	★	★	★							★
IV	17	Prime Gold™	★		π	★					★	★	★	★				★	★	★	★
IV	18	Pent 'Em In™	★						★		★	★	★	★							★
IV	19	Frac Fact™	★		★	★					★	★	★	★	★						
IV	20	Fraction Pinball™	★			★									★	★					

Logical/Scientific Reasoning

Div	#	Game	Observation	Classification	Communication	Patterning	Hypothesizing & Experimentation	Deductive Reasoning	Inductive Reasoning	Number Theory	Combinatorics
I	1	Kings & Quadraphages™	★	π	★	★	★	★	★		★
I	2	Calla™	★		★	★	★	★	★		★
I	3	Hex-A-Gone!™	★	★	★	★	★	★	★	★	★
I	4	Shape-Up™	★	★	★	★	★	★	★		★
I	5	Star Track™	★		★	★	★	★	★		★
II	6	FIAR™	★	★	★	★	★	★	★		★
II	7	Sum Dominoes & Dice™	★	★	★	★	★	★	★		★
II	8	Ramrod™	★	★	★	★	★	★	★	π	★
II	9	PAR 55™	★	★	★	★	★	★	★		★
II	10	Kwatro-Sinko™	★	★	★	★	★	★	★		★
III	11	Contig 60™	★	★	★	★	★	★	★	★	★
III	12	Juggle™	★	★	★	★	★	★	★		★
III	13	Stars & Bars™	★	★	★	★	★	★	★		★
III	14	Queens & Guards™	★	★	★	★	★	★	★		★
III	15	Fab-A-Diffy™	★	★	★	★	★	★	★		★
IV	16	Remainder Islands™	★	★	★	★	★	★	★		★
IV	17	Prime Gold™	★	★	★	★	★	★	★	★	★
IV	18	Pent 'Em In™	★	★	★	★	★	★	★		★
IV	19	Frac Fact™	★	★	★	★	★	★	★		★
IV	20	Fraction Pinball™	★	★	★	★	★	★	★		★

Spatial/Geometric Reasoning

Div	#	Game	Geometric Figures & Regions	Directionality	Topology	Networks	Structural Analysis of Space	Symmetry & Reflections	Congruence	Similarity	Area	Transformational Geometry
I	1	Kings & Quadraphages™	★	★	★		★	★			★	
I	2	Calla™		★								
I	3	Hex-A-Gone!™	★	π			★	★	★	★	★	★
I	4	Shape-Up™		★				★		★		★
I	5	Star Track™		★								
II	6	FIAR™		★		★	★	π	π	π		π
II	7	Sum Dominoes & Dice™		★								
II	8	Ramrod™	★	★		★	★	π			★	π
II	9	PAR 55™		★		★	★			★		
II	10	Kwatro-Sinko™		★				π				π
III	11	Contig 60™		★			★					
III	12	Juggle™	★		★		★	★	★		★	★
III	13	Stars & Bars™	★	★			★					
III	14	Queens & Guards™	★	★			★	★				
III	15	Fab-A-Diffy™		★							★	
IV	16	Remainder Islands™		★	★	★	★					
IV	17	Prime Gold™		★			★					
IV	18	Pent 'Em In™		★				★	★		★	★
IV	19	Frac Fact™		★							★	
IV	20	Fraction Pinball™		★		★	★					