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Nota di contenuto	Part I: The Landscape of Discrete Mathematics in the School Curriculum -- Discrete Mathematics is Essential Mathematics in a 21st Century School Curriculum (and introduction to this volume) -- The Absence of Discrete Mathematics from Primary and Secondary Education in the United States and Why that is Counterproductive -- Discrete Mathematics in Lower School Grades? Situation and Possibilities in Italy -- Discrete Mathematics and the Affective Dimension of Mathematical Learning and Engagement -- Part II: Combinatorics and Combinatorial Reasoning -- Combinatorial Reasoning to Solve Problems -- Children's Combinatorial Counting

Strategies and their Relationship to Mathematical Counting Principles -- Reinforcing Mathematical Concepts and Developing Mathematical Practices through Combinatorial Activity -- Complex Mathematics Education in the 21st Century: Improving Combinatorial Thinking based on Tamás Varga's Heritage and Recent Research Results -- Part III: Recursion and Recursive Thinking -- Discrete Dynamical Systems: A Pathway for Students to Become Enchanted with Mathematics -- How Recursion Supports Algebraic Understanding -- Part IV: Networks and Graphs -- Food Webs, Competition Graphs, and a 60-year-old Unsolved Problem -- Graph Theory in Primary, Middle and High School -- Part V: Fair Decision-Making and Game Theory -- Fairness -- Mathematical Research in the Classroom via Combinatorial Games -- Machines designed to play Nim games (1940-1970): A possible (re)use in the modern French mathematics curriculum? -- Part VI: Logic and Proof -- Mathematics and Logic: Their Relationship in the Teaching of Mathematics.

Sommario/riassunto

This book discusses examples of discrete mathematics in school curricula, including in the areas of graph theory, recursion and discrete dynamical systems, combinatorics, logic, game theory, and the mathematics of fairness. In addition, it describes current discrete mathematics curriculum initiatives in several countries, and presents ongoing research, especially in the areas of combinatorial reasoning and the affective dimension of learning discrete mathematics. Discrete mathematics is the math of our time.' So declared the immediate past president of the National Council of Teachers of Mathematics, John Dossey, in 1991. Nearly 30 years later that statement is still true, although the news has not yet fully reached school mathematics curricula. Nevertheless, much valuable work has been done, and continues to be done. This volume reports on some of that work. It provides a glimpse of the state of the art in learning and teaching discrete mathematics around the world, and it makes the case once again that discrete mathematics is indeed mathematics for our time, even more so today in our digital age, and it should be included in the core curricula of all countries for all students.