

Preface

Research seems to indicate that the human brain innately seeks to make meaning from and find relevance in its surroundings. Through relevant and meaningful learning, students are able to painlessly “absorb” knowledge rather than struggle with its acquisition. The positive interdependence between the learner’s natural curiosity and search for meaning, and the project-based method of instruction can be demonstrated by the fact that the intrinsic reward of a job well done motivates the students far beyond any extrinsic reward previously offered. Natural curiosity becomes the motivation for students—the desire to see what “the results will show.”

This book has been designed to make the implementation of a brain-compatible, project-unit approach to mathematics instruction readily available to teachers of all grade and ability levels. It is structured so that the beginning of each chapter introduces the reader to the important topic information, discusses that information in depth, and then finishes with “hands-on” project units ready for immediate implementation, complete with instruction outlines, evaluations, and rubrics for teachers, as well as student reflection guides.

The units in each of the chapters have been aimed at specific grade levels, yet the ideas, in most cases, can apply up or down so as to be applicable for almost any grade. The units in Chapter 1 have been created to be developmentally appropriate for grades K–2, while Chapter 2 contains units for grades 3–5. Chapter 3 includes units for grades 6–8, and Chapters 4, 5, and 6 each contain “challenge project units” that can be easily adapted for the secondary-level mathematics classroom.

The book elements have been devised for ease of implementation, with rubrics and charts that organize and clarify the chapter information. Blank templates have been included along with the rubrics and organizers to ease the reader’s transition toward a more brain-compatible classroom.

Chapter 1 covers the background of and rationale for brain-compatible learning, including such topics as performance instruction and assessment. Chapter 2 discusses the creation of performance tasks and offers strategies for their implementation, while Chapter 3 introduces Howard Gardner’s theory of multiple intelligences. Chapter 4 deals with performance-based instruction and Chapter 5 offers problem-solving strategies. Chapter 6 goes into detail about assessment and rubric design, while Chapter 7 describes portfolio assessment.

At the back of the book you will find a Glossary, a Resources section, and a Bibliography.

When planning instruction, give thought to how you might mesh brain-compatible concepts with your traditional text. One way might be to choose a project unit in which the task encompasses the very concepts you are currently covering, and introduce that project as a means of reinforcing the instruction, transforming it into an enduring learning that will stay with your students well beyond their time in your classroom.

Enormous strides have been made in the field of mathematics education since the original National Council of Teachers of Mathematics (NCTM) Standards document was first published in 1989. Yet, there is still much to do for this paradigm shift to be complete. This book is about making that shift easier for the classroom teacher already overloaded with demands from students, parents, administrators, and school districts. I hope that this guide will make the teacher's role more enjoyable, and the students' role more successful.