

Introduction

TOOLS OF THE TRADE

A lesson design is to a teacher what a recipe is to a chef, a blueprint to an architect, or a game plan to a coach. Not only does the recipe tell the chef what ingredients are needed; it also prescribes the amount of each ingredient, the sequence for combining the ingredients, and the preparation techniques required to prepare the dish. In similar fashion, an architect creates a construction blueprint on which are the types of materials needed to construct the building, the amount of each material, the construction plan, and the guidelines for construction. Coaches follow a similar process while preparing their teams. They choose the offense and defense that are most likely to counter the strengths of the opponents, they assign each athlete to the best playing position, and they rehearse the strategies to insure that their athletes have the competence and confidence to execute well.

Likewise, lesson plans guide teachers in selecting activities that work best for helping students understand lesson concepts and acquire new information, in determining how long to spend on each learning activity, and in deciding when each activity should be included during the learning process. Lesson plans are the recipes, blueprints, and game plans for engaging students in a successful learning process.

However, lesson plans are just that—plans. What really makes lessons come alive are the skillful strategies employed by teachers. The underpinnings for each successful lesson plan are the brain-compatible teaching or instructional strategies that work best to provide appropriate learning experiences for students. These strategies are the teacher tools. Not only do teachers need to select the tools for each lesson, they need to become more skillful in the use of these tools. A comparative analogy is the architectural blueprint. Competent construction workers not only know how to read the blueprints, but they also know which tools to select for each part of the construction job, and they have the skills to use those tools correctly. Their ability to choose the appropriate tools from their “tool belt” for each part of their job and their expertise in the use of those tools will determine the quality of the finished construction project. The same principles apply to teachers. The lesson plan is lifeless until skilled teachers bring it to life by selecting their best tools from their teacher tool belts.



The emphasis throughout this book on brain-compatible learning is an effort to capitalize on the latest brain research and on its implications for the classroom. Learning how information gets into the brain and what the brain does with that information can be very helpful in making sure lessons in the classroom have the best chance of being understood and have the best chance of getting into long-term memory.

Brain-Compatible Learning for the Block is a highly practical resource for teachers, not just as a blueprint but as an instructional guide to creating one's own blueprints (lesson and unit plans). Each of the first five chapters provides a detailed sample Four-Phase lesson, which includes standards identified by James S. Kendall and Robert J. Marzano (1997) in their *Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education*.


The four phases of the lessons are inquire, gather, process, and apply, a design built upon the concepts of the "three-story intellect" and the processing model.

The purpose of the inquire phase is to help learners identify what they already know about the concept(s), information, or skill(s) to be covered in the lesson. Students explore what they know by determining past experiences that relate to the topic, by retrieving from long-term memory previously formed associations with the topic, and by identifying skills they have previously acquired. During this phase students discover what other students know about the lesson content. And just as important, students discern how they feel about the lesson topic, how motivated or reluctant they are, and what they would like to learn. Some may even be clear how they would like to go about learning what that would like to learn.

The primary purpose of the second phase of the lesson design, the gather phase, is to help students collect new information related to the lesson topic, to create a new schema or mental model, and to refine an existing schema. Strategies teachers employ during this phase need to engage students in learning experiences that add to or enlarge their knowledge base and that connect the new information to what they already know or understand. Teachers need to select tools that will guide students through the process of creating new schemas and refining previously formed schemas.

As a function of the processing phase, students experience activities that will assist the brain as it stores new information into long-term memory (Sprenger, 1998). Teachers guide students beyond the process of rote memorization and help them create their own meaning. Comparing examples, targeting the similarities among examples, and helping students encode and organize the similarities among examples help students learn contextually.

To engage in thinking without acting upon what the brain is thinking about is antithetical to what the brain is designed to do—think and act (Sylwester, 1995). During the processing phase, students are provided with an opportunity to knead and manipulate the knowledge and concepts, data, skill, techniques, or behaviors, ultimately molding them into a tool that they can use to carve out meaning from that which they encounter in



real life. Strategies selected during this phase include complex activities that engage the whole student—cognitive, affective, and psychomotor—as part of the processing experiences (Bruer, 1998). Such things as speaking, reading, writing, interacting, performing, planning, problem solving, and organizing need to be part of using all new information and skills.

The purpose of the apply phase is to use the tools forged in the previous phases in a relevant and practical context to create something new. The focus in this phase is to help students improve their proficiency under a variety of conditions or situations. The teacher engages in the direct teaching of transfer. Transfer can be presented as the ways the lesson content is connected to other disciplines, such as how a music lesson on fugues has applications to a math class or how the language arts lesson on Shakespeare's *Julius Caesar* is related to a speech or debate class. Transfer can also be related to the multiple intelligences, such as how an understanding of a math concept like trigonometry (logical/mathematical) can be used in solving problems related to putting a shot, platform diving, or uneven bars in gymnastics (bodily/kinesthetic). Generalization and transfer are recognizing problems in new and different settings. The apply phase connects the material to the real life of the student.

Brain-Compatible Learning for the Block is presented in six chapters. The first five chapters acquaint the reader with the tools (strategies and techniques) that will help them implement and ultimately design their own Four-Phase lesson and unit plans as set forth in the sixth chapter and in the samples provided throughout.

Chapter 1: "Physiology and Philosophy" provides an in-depth discussion of what recent research in the area of neuroscience seems to indicate about the brain's structure and multi-functionality and the implications for education.

Chapter 2: "Four-Phase Lesson and Unit Design" suggests the fine points of this innovative and dynamic design scheme. An outline of a sample unit is included.

Chapter 3: "Time for Brain-Compatible Learning" explores various alternative scheduling formats and the impact time has on learning.

Chapter 4: "Content and Curriculum" examines the weighty issue of content coverage and makes several practical suggestions for using the gift of time that alternative scheduling provides to delve deeply into content.

Chapter 5: "Instruction: The Art and Science of Teaching in Alternative Time Periods" focuses on brain-compatible educational principles and strategies that help teachers build a robust and exciting learning climate. In addition, ways in which an alternative schedule can make time for ongoing professional development are discussed.

Chapter 6: "Assessment: Measuring Achievement and Growth in Alternative Time Periods" balances the reality of standardized testing with the opportunity that authentic assessments provide to "catch" students learning.

Some may wonder how this new edition has been revised and updated. Since the first edition of this book was written, brain research has



been made even more available to the education community. We included quite a lot of that research in this revision. In addition, we added vignettes based on actual classroom situations to help bring to life the approaches we are recommending. These vignettes are found in the sample lessons at the ends of Chapter 1 and Chapters 3 through 6. We have added new material on differentiated learning and schema development and have included additional activities highlighting the bodily kinesthetic. Finally, we have added several figures illustrating instructional strategies and their connection to the four-phase lesson plan, to multiple intelligences, and to the structure of practical, analytic, and creative—Sternberg’s structure. We believe that all teachers will find this material valuable. With this in mind, we have used not only the term *block scheduling* but also the term *extended time formats* to clarify the book’s relevance for anyone teaching in a period that is longer than thirty to forty minutes. We hope that this new edition challenges and inspires educators with concrete and practical ideas, and the promise of an enriched learning environment for both students and teachers.