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INTRODUCTION

Brain-Compatible Classrooms (BCC) is a book with a bit of a history. It is a reconceptualisation of an earlier work titled, *Patterns for Thinking, Patterns for Transfer (Patterns)*. Based on a framework of four elements, *Patterns* presents a classroom model that advocates teaching *for, of, with, and about* thinking.

In essence, that same framework is restructured in *BCC*. Officially called the four-corner framework, this framework addresses the same four elements: setting the climate *for* thinking, teaching the skills *of* thinking, structuring the interaction *with* thinking, and thinking metacognitively *about* thinking. However, in *BCC*, the framework is really grounded in the emergent brain research, as well as in the sound pedagogical theory present in *Patterns*.

Chapter 1 of *BCC* presents the basics of the brain research in a brief discussion that is intended to provide an introductory awareness of the human brain and how it works. It begins with a thumbnail sketch of the physiology of the brain and the brain cell and proceeds to the functionality of how the brain/mind thinks, learns, and remembers. While this opening section serves to begin the conversation about the human brain, hopefully, it also serves as a bridge to further readings in the field of brain research.

Chapter 2 builds on this research base by applying the findings to the four-corner framework. Using a brilliant synthesis of the brain research, Renate and Geoffrey Caine have developed twelve principles that have compelling implications for the classroom. These twelve principles guide the creation of the framework and are summarised in the graphic on page x.

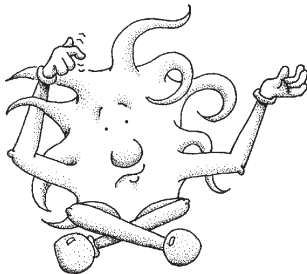
In sum, the climate *for* thinking is governed by a safe climate and an enriched environment; skills *of* thinking encompass not only the types of skills but the developmental path of those skills; interaction *with* thinking targets active/experiential learning; and thinking *about* thinking highlights the reflection and assessment aspects of the high standards classroom.

CHAPTER 1

BRAIN RESEARCH BASE

Physiology

She's a brain! You're a numskull! That's a harebrained idea! Have you lost your mind? Are you out of your mind? Put on your thinking cap. Use your noodle. I'm having a brain drain. Use your grey matter. These are just some of the remarks one hears in everyday references to the brain and the mind. In fact, these sayings offer concrete evidence for the common understandings people have, and have had for some time, about the brain. Yet, with the recent avalanche of information available through brain imaging technologies about cognitive functioning, interest in the brain seems to be increasing. As brain research explodes in what is known as The Decade of the Brain (Klein 1997), parents, teachers, educators, and students themselves have become intrigued with the emergent knowledge of how their brains remember and learn.



What Are the Facts About the Brain?

Scientists have discovered several facts about the 100 billion nerve cells, called neurons, that make up the organ called the human brain. This unique organ is located in the head and is protected by the cranium, or skull. The average brain weighs approximately 1 ½ kilograms, is about the size of a cantaloupe split in half, appears wrinkled like a walnut, and feels somewhat like an avocado that has ripened.

While the brain accounts for only 2 percent of a person's body weight, it uses 20 percent of the energy in the body and generates twenty-five watts of power (enough energy to illuminate a light bulb) when a person is awake. Messages travel within the brain through neural connections at speeds up to 400 kilometres per hour, and several billion bits of information pass through your brain each and every second of your life.