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SECTION II
SAMPLE UNIT TASKS

INTRODUCTION

How Can We Change Instruction to Make It More Brain-Compatible?

Performance-based learning is an instructional methodology that makes use of the recent research into brain function, and the implications of this research for education. It focuses on not only the manner in which students gain knowledge, understanding, and proficiency, but also the manner in which students demonstrate these skills.

Recent research into brain physiology and function is providing a newer understanding of how humans learn by helping us redefine our concept of intelligence. These investigations have revealed that our established methods of educating children inhibit rather than encourage their learning. By discouraging, ignoring, or working against the natural learning processes of the brain, our traditional didactic methodologies appear to hinder rather than help the brain learn.

To explain it in simple terms, the brain consists of three major blocks: the brain stem, the limbic system, and the cortex. While the brain stem controls life functions such as breathing and heartbeat, the limbic system serves as the seat of emotion, and the cortex contains the neural networks that result in our capacity for logic and reason. Scientists divide the cortex into four areas called lobes: occipital, frontal, parietal, and temporal.

The occipital lobe, in the rear of the brain, is responsible for vision, while the frontal lobe is involved with problem solving and creativity. The parietal lobe (located in the top area) processes the higher thinking skills and language functions. The temporal lobes (left and right sides) are primarily responsible for hearing, memory, meaning, and language. There is overlap in the functions of these lobes since the entire brain works as an integrated unit. The area in the middle of the brain includes the hippocampus, thalamus, hypothalamus, and amygdala. This midbrain area is also known as the limbic system.

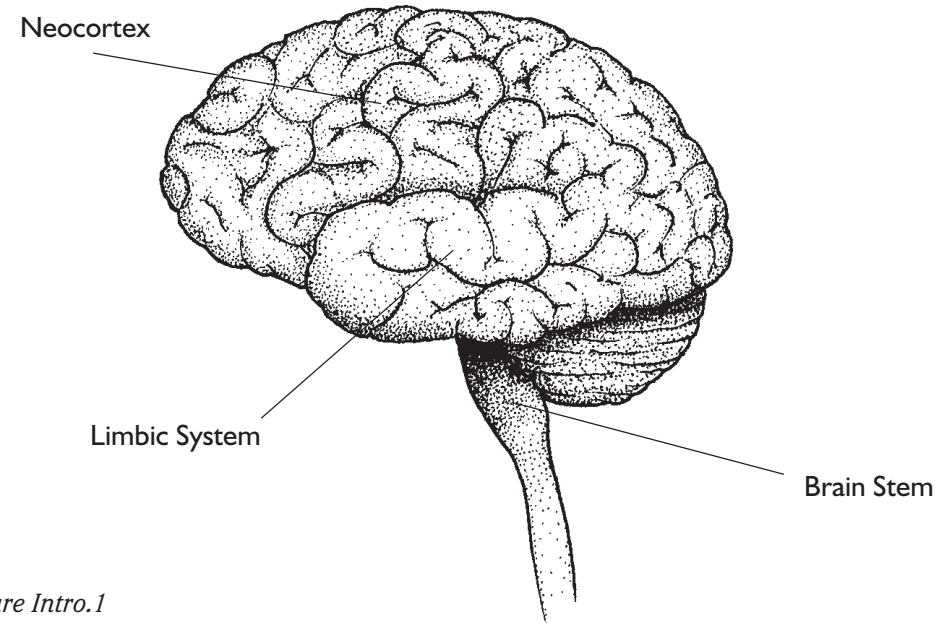

Figure Intro.1

From *Brain-Compatible Classrooms,* by Robin Fogarty. © 1997 by SkyLight Training and Publishing, Inc. Reprinted with permission of SkyLight Training and Publishing Inc., Arlington Heights, IL.

The brain stem, limbic system, and cortex (see Figure Intro.1) all work through an electromagnetic process which distributes both chemicals and electrical charges through a network of connections extending throughout the brain and body. Recent research has revealed that the process of learning begins with the growth of additional neural connections stimulated by the passage of electrical current along nerve cells (neurons) and is then enhanced by chemicals (neurotransmitters) discharged into the spaces between neighbouring cells (synapses). Each time a particular pathway is used, additional connections are created that ease the future use of those same neurons.

If learning is the development of connections between neural networks, then the question is whether we can enhance such growth through education. The notable theorist Davis Perkins has advanced the theory that there are three different kinds of intelligence: neural, experiential, and reflective. We receive neural intelligence at birth. The networks established at birth may vary from person to person, giving some individuals the capacity to process incoming signals more quickly or with more discrimination than others. The second and third intelligences, experiential and reflective, are more malleable