What’s The Buzz About?
Brain-Based Learning for All Students

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Each lobe of the brain is responsible for a different function. Their functions are:

Frontal Lobe - thought, consciousness, planning, language expression, speech, and movement
Parietal Lobe - touch and taste
Auditory Cortex - hearing
Temporal Lobe - language reception
Occipital Lobe and Visual Cortex - sight
The functions of the brain’s areas:

Cerebral Cortex - responsible for coordination of sensory and motor information
Basal Ganglia - control system for cognitive functions
Corpus Callosum - connects the left and right hemispheres
Hypothalamus - influences certain emotions
Pituitary Gland - secretes hormones
Amygdala - associated with behavioral, emotional, and procedural memory, and processes fear
Thalamus - transfers sensory information to the Cerebral Cortex
Cerebellum - controls balance and movement
Hippocampus - helps establish long-term memory
PRINCIPLES OF BRAIN-BASED LEARNING

The Brain-Based Learning Theory is based on neuroscience. Knowing how the brain functions allows us to understand how and why people learn. The theory is based on twelve core principles.

1. The brain can perform several activities at once.

2. Learning engages the whole physiology.

3. The search for meaning is innate.

4. The search for learning comes through patterning.

5. Emotions are critical to patterning.

6. The brain processes wholes and parts simultaneously.

7. Learning involves both focused attention and peripheral perception.

8. Learning involves both conscious and unconscious processes.

9. We have two types of memory: spatial and rote.

10. We understand best when facts are embedded in natural, spatial memory.

11. Learning is enhanced by challenge and inhibited by threat.

12. Each brain is unique.

(Information provided by Funderstanding.com)
CLASSROOM IMPLICATIONS

The Brain-Based theory is really a “best practices” approach to teaching. It incorporates many of the strategies that expert teachers have used for years, but now have validated physical reasons for their effectiveness.

Some strategies you can incorporate into your school and classroom are:

◊ Be flexible! Allow for classroom discussions that revolve around students' interests. When students are interested in their own learning, attention rises, and long-term memory is activated.

◊ Provide resources for students to further their understanding on their own. Encourage them to take their learning to a higher level. Keep a classroom library, including content-related, and interest-centered materials.

◊ Provide places for group learning. The brain functions at a high level in social settings. Table groupings, break-out spaces, alcoves, and “living rooms” for conversation allow students to interact within the classroom.

◊ Make learning REAL for students. Relate content to their real lives and interests. When students see a relevance to what they are learning, and when true real world connections are made, the brain tunes itself into the material at hand. Help your students to discover their own meaning and relevance through your own modeling. Let them know you are human, too!

◊ Teach others in your school about the theory. Having a school-wide belief provides a sense of community and contiguity within classrooms. In-services, faculty meetings, and casual lunches in the staff lounge are all great ways to share your expertise.
◊ Provide active and passive places for learning. Students need areas where they can be engaged in activities, and also quiet places for reflection. The brain sends out strong beta waves, when engaged in active learning. It also needs time to reflect and be creative, acting in an alpha state. Both of these states are vital to long-term retention.

◊ Provide a personalized classroom. Allow students to help set up the room. Display their work. Students will be engaged in an environment in which they feel ownership.

◊ Link indoor and outdoor places. The brain feeds on oxygen. Allowing students to be outdoors stimulates the brain. Location also plays a role in retention. Students will remember an idea or concept based on where YOU were when you taught it. Adding an outdoor experience will separate the new information, and will assist in recall of the facts.

◊ Change classroom displays. Bulletin boards were NOT designed to be left the same from September through June. Use these areas as creative outlets for your students. The brain loves novelty, and is more attuned to learn when the environment changes.

◊ Vary the classroom setting. Learning is often associated with time and space. By varying the seating arrangement and the location from which you teach, students can associate location with the topic. By varying the arrangement within a class period, the brain refocuses and is recharged to accept new information.

◊ Provide a rich, stimulating classroom environment. Students must feel safe in order to learn. Encourage your students to question their learning and push the bar; however, keep them feeling comfortable. Fear can actually KILL brain cells!

◊ Incorporate music into your daily lessons. Music actually stimulates brain waves to process information. Quiet music in the background can help students learn! The “Mozart Effect” says that quiet, soft music in the background during
active studying (Beta waves), with louder, more upbeat music during reflection (Alpha waves) provides an open pathway into long-term memory. Musical Intelligence is the most complex and strongest intelligence we possess. When transitioning between activities, play a snip-it of music to reconfigure the brain’s chemical make up. Its effects on memory are profound!

◊ Use the Multiple Intelligences! It’s not just a theory any more – Gardner’s research has neurological backing.

◊ Feed the brain chocolate! The chemicals found in chocolate help the brain with memory and recall. Other foods that effect memory and recall are fish (proteins), peppermint, and leafy green vegetables. Keeping the brain hydrated is also important!

◊ Stimulate prior knowledge when teaching any topic. The brain needs to make connections for learning to take place.

◊ Use graphic organizers. Visual, categorical reinforcement aids in retention. These tools also help the brain to process connections between facts, again, instilling the information into long-term memory.

◊ Color-code your materials. The brain will store the information through the use of color. Using colored paper or a symbol on each page helps the brain categorize the information, and aids in recall.
The responses to William Gardner's Multiple Intelligences theory when it was first introduced were varied. Like most theories, there were skeptics and those who jumped on board. Now, there is neurological research to support his theory, and prove that people really do have different types of intelligence. Intelligence is about more than just “book smarts” these days. His categories are:

**Visual/Spatial**  These students are the artistic, creative, free spirited children we find in our classrooms. Provide them with opportunities to express their creativity!

**Linguistic**  These students love language, and thrive with literature, writing, lecture, and note-taking. You can rely on these students to develop mnemonic devices for the entire class to use.

**Logical/Mathematical**  As the name suggests, these student excel in mathematics and science. Provide opportunities for them to use their strengths in any content area.

**Intrapersonal**  These students find knowledge from within themselves, and prefer individual over cooperative activities. You can use journaling, portfolios, and reflection opportunities for these students.
### More Multiple Intelligences

<table>
<thead>
<tr>
<th>Interpersonal</th>
<th>Our most social students fill this category. Provide them with opportunities to be interactive through activities such as role playing, cooperative learning, and presentations.</th>
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<tbody>
<tr>
<td><strong>Body Kinesthetic</strong></td>
<td>These students learn best through movement and hands-on activities. Allowing them to role play, perform, and demonstrate their knowledge through actions will engage these students.</td>
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<tr>
<td><strong>Musical</strong></td>
<td>Playing music in the background has been proven to have positive effects on brain activity. These students are naturally engaged using this stimulus. Allow them to express their creativity and talent by encouraging them to put their own learning to music with raps, jungles, and chants.</td>
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<tr>
<td><strong>Naturalist</strong></td>
<td>Our Naturalists are most comfortable in the outdoors. By bringing a class outside, these students are in their most comfortable environment, and most ready to learn. Changing location also helps all students identify learning with location, assisting in recall of information.</td>
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WAYS TO PREPARE THE LEARNER

1. Educate students about their brains. Knowing and understanding the structure of the brain helps students better understand that they are all physiologically the same. However, how they use their brains helps make the difference. This knowledge can also help students regulate their own behavior in and out of the classroom.

2. Have students set goals. When students set personal goals it helps them to “think smart”. Educate your students on goal-setting skills and incorporate them into class assignments. For example, when assigning a research project have the students meet resource deadlines as well as first and second draft deadlines.

3. Explain how the brain requires adequate sleep. Inadequate sleep can affect how students learn and their ability to concentrate, retain information and store information into their memory. Teach your students to “sleep smart” so they are prepared to learn.
**More Ways To Prepare The Learner**

4. Educate students about the importance of food and nutrition and its effects on the brain. With proper nutrition students can increase their ability to learn and remember. Certain foods such as fats, carbohydrates, sugars and certain proteins can decrease ones ability to learn.

5. Educate students about the major role water has on all the body systems and their functions, especially the brain. Promote students to drink water all day long to keep from becoming dehydrated. When people become dehydrated, their ability to concentrate and learn diminishes.

6. Educate students about the different learning styles and help them understand the different ways brains receive, process and express information. With this knowledge students can benefit from their preferred learning style and can be taught other ways of learning also.
For more information, check out these resources:

http://members.aol.com/Rss1540/brain.html

www.designshare.com

www.funderstanding.com

www.web3.epnet.com


