

The BRAIN WAY Newsletter

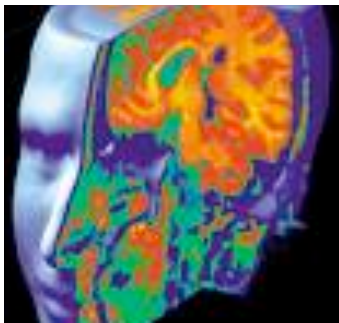


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This newsletter will keep you posted on the latest research in **BRAIN SCIENCE** and how it can be put to **IMMEDIATE** use in your classroom. AND...exciting new resources that help make everyday a brain-friendly day in your classroom.

Interested in helping you students remember more of their learning? Want to maximize student memory and minimize the amount of time spent on re-

teaching? Then a look at memory encoding, storage, and retrieval is for YOU!



Memory is a very mysterious and complex topic in neuroscience. But,

there are at least TWO ideas that are essential for educators: 1. Bits and pieces of a memory are stored in different areas of the brain; 2. Recall involves the “putting back together” of these memories.

A memory can be broken down into four major subtypes. The words, symbols, facts, and figures are **SEMANTIC** memories. The location, circumstances, and events make up **EPISODIC** memories. If the memory contains physical skills, manipulatives, hands-on learning, or body-learning they would be **PROCEDURAL** memories. How the memory made you feel is the **EMOTIONAL** memory.

Each of the memory subtypes, which scientists often debate on the exact number of subtypes, is stored in various locations in the brain. If a student listens to a lecture, that memory is ONLY SEMANTIC and is stored in one location. If a student listens to a lecture (SEMANTIC), discusses it with a group, moves to different locations in the room while learning it (EPISODIC), develops a movement associated with the learning (PROCEDURAL), and does something exciting with it (EMOTIONAL), that memory is stored in multiple locations. Which student is more likely to later recall the learning?



NEWS FLASH: utilizing multiple memory pathways (semantic, episodic, procedural, and emotional) increases the odds of recall later on!

So, what does this mean for the classroom: utilize as many memory subtypes as possible. Each learning episode should have a semantic component, episodic component, procedural component, and emotional component.

SLEEPING AND MEMORY



Data suggests that the formation of long-term memories, also called long-term potentiation (LTP) is dependent upon the cAMP/MAPK/CREB transcriptional pathway in the hippocampus during the circadian cycle (Eckel-Mahan et al., 2008). **WHAT THE HECK DOES THAT MEAN?**

Previous work in memory formation has shown that short-term memories may be strengthened into long-term memories during sleep. Certain chemicals rise and fall in a rhythmic pattern. In mice, these chemicals peak during the day and fall during the night (by the way, mice sleep during the day). Eckel-Mahan's research team from the University of Washington in Seattle found that these peaks coincided with memory formation in mice. When the researchers disrupted the sleep patterns of the mice, memory formation and **RECALL** of previous learned information was disrupted. **TAKE HOME MESSAGE: lack of sleep may disrupt memory FORMATION and RECALL OF ALREADY LEARNED INFORMATION!**

GREAT MEMORY FOODS!

- Fish (trout, salmon, tuna)
- Eggs
- Soybeans
- Lean Beef
- Whole Grains, Beans, and Nuts
- Chicken
- Bananas, Avocados, Blueberries, Tomatoes
- Fresh Fruit Juice, Green Tea, and WATER
- Leafy Greens, Broccoli, Peas, and Carrots



These foods provide key nutrients and chemicals needed for optimum brain and memory function such as: choline, phenylalanine, vitamin B-6, vitamin E, glutamic acid, protein, omega-3 fatty acids (DHA), tyrosine, and ribonucleic acid.



BRAIN BUSTING MEMORY BOOSTING STRATEGIES!



1. Use fill-in notes for lectures (SEMANTIC and PROCEDURAL).
2. Have students move to different locations in the room to discuss new learning (EPISODIC).
3. Use music and personal stories that relate to the new learning (EMOTIONAL).
4. Develop movements or hand motions for new content (PROCEDURAL).
5. Have students summarize learning through writing or developing mind-maps...use color and pictures (SEMANTIC and EMOTIONAL).
6. Have students spell out key words and concepts using their right elbow or left big toe (PROCEDURAL).
7. Let students experience a WOW or AH-HA moment in their learning (EMOTIONAL).

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