

What is consolidation?

Brain Rule #7: Repeat to remember. Consolidation is the process of converting short-term memory traces to long-term memory. As we acquire new experiences, information, and memories, our brains create connected networks of neurons. By rehearsing or recalling information over and over again, these neural networks become strengthened. Harvard psychologist Dan Schacter suggests, “if you want to study for a test, and you are able to go through the material 10 times, it is better to space out the 10 repetitions than squeeze them all together.” Every time you start the process of relearning, your brain is forced to re-consolidate the new information, which strengthens the neural networks (Page 150). How are you spiraling your content so students are forced to repeat to remember?

What is meant by three brains in one? (or trine brain)?

Brain Rule #1: The human brain evolved, too. We don't have one brain in our head—we have three. We started with a “lizard brain” or our brain stem. This part of our brain is responsible for the body’s housekeeping chores: breathing, heart rate, sleeping, waking. On top of that sits our mammalian brain, which is similar to the brain of a cat. This part of the brain is responsible for the four F’s: Fighting, Feeding, Fleeing, and ...reproductive behavior. On top of that sits a thin layer of Jell-O known as the cortex—the third, and powerful, “human” brain. Each region of the cortex is highly specialized with sections for speech, vision, and memory.

What are the principles of multimedia presentations?

Brain Rule #8: Stimulate more of the senses. In his book, *Multimedia Learning*, Mayer gives the following useful rules for anyone teaching a class (Page 175). 1) Students learn better from words and pictures than from words alone 2) Students learn better when corresponding words and pictures are presented simultaneously rather than successively. 3) Students learn better when corresponding words and pictures are presented near to each other rather than far from each other on the page or screen. 4) Students learn better when extraneous material is excluded rather than included. 5) Students learn better from animation and narration than from on-screen text

What is the 10 minute rule?

Brain Rule #6: We don't pay attention to boring stuff. An audience's attention rarely remains focused for more than 10 minutes. Classroom lectures, then, should follow this 10 minute guideline. Lectures should begin with a general rule, explainable in one minute. The next 10 minute segment should be followed by a "hook," a single statement summarizing an emotional, physical, comic or otherwise incongruent response that encourages attention to shift. Successive 10 minute segments continue: 10 minutes of lecture, followed by 1 minute hooks. Hooks should trigger an emotion, be relevant, and must separate the segments (Page 120). How are you regaining students' attention every 10 minutes?

Why is a picture worth 1000 words?

Brain Rule #9: Vision trumps all other senses. In evolutionary history, visual acuity proved more effective in evading threats and stalking prey than the other senses. Good eyesight led to our survival. The fact that vision occupies far less resources in the brain than other senses is testament to its effectiveness, called the pictorial superiority effect. When given text to interpret, the brain processes letters as individual, tiny pictures of angles, spaces, letters, and then words. Taking time to process each letter slows comprehension and accuracy (Page 191 - 192). So, how are you using pictures in your classroom?

Hummingbirds Larks, Owls, and What are Chronotypes?

A person's "chronotype" is based on personal circadian rhythm: whether an individual arises early or late. It is the sleep and wake pattern programmed by genetic code (Page 44-45).

Larks ("the early chronotypes") are those who prefer to arise early, who enjoy working in the mornings, and are ready for bed by 9:00 p.m. They cover only about 10 percent of the population.

Owls ("the late chronotypes") are most alert in the evening, preferring to work in early evening. They often remain awake until 3:00 a.m. Despite this pattern's conflict with American social and business practices, they still encompass 10 % of the population.

Hummingbirds consist of the remaining 80% of society. As with any continuum, Hummingbirds are scattered between the Larks and Owls, exhibiting traits leaning one way or the other.

What if we considered this as a personality trait when advising students?

What is BDNF & what does it have to do with learning?

Brain Rule 2: Exercise Boosts Brain Power. BDNF stands for Brain-Derived Neurotrophic Factor, and according to Harvard psychiatrist John Ratey, it is “miracle-Gro, brain fertilizer.” Exercise stimulates BDNF which in turn encourages the creation of new brain cells in areas of the brain important to cognition. So, how do you get your students up and moving? (Page 31)

What is the Curse of Knowledge?

Most experts are so familiar with their topics of interest that they forget what it is like to be a novice. They simply can no longer remember what it is like to not know something.

Novices need time to connect the dots. (Page 119) How do you know that your students know? In a famous psychological experiment, a group of subjects was divided in two: tappers and listeners. The tappers were asked to think of a song and try to rhythmically tap the song on a table, while the listeners were asked to listen and figure out which song the tappers were tapping along to. The tappers were 50% certain that the listeners would be able to identify the song they had had in mind while tapping, but the results of the experiment were shocking: only 2.5% of the listeners were able to figure out the song!

How is the Amygdala different in Men and Women?

Brain Rule #11: Male and female brains are different. Men handle stressful/emotional situations differently than women. Researcher Larry Cahill and others have found that men respond to situations by firing up the brain's right hemisphere (the part of the brain responsible for gist) while women fire up the the left hemisphere (the part of the brain responsible for details). This is why women consistently report more detailed and vivid memories of things like arguments, first dates, and vacations. (Page 232)

How does stress affect learning?

Brain Rule #4: Stressed brains don't learn the same way. In almost every way it can be tested, chronic stress hurts our ability to learn. One study showed that adults with high levels of stress performed 50 percent worse than adults with low levels of stress on tests of declarative memory and executive function (Page 65). What kinds of things are you doing to create a stress free environment in your classroom?