

**Learn How to Supercharge Your Reading Workshop
With Balanced Literacy and Brain-Based Strategies**

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"Brain-based or brain compatible..."

Brain-based or brain compatible learning is based on how research in
`**neuroscience suggests our brain naturally learns best.**

When you understand how memory works, you have the tools to improve your job performance, school achievement, and personal success

Some Brain Facts

"Your brain works on electrochemical..."

- Your brain works on electrochemical energy
- Weighs approximately 3 pounds
- Size of fists together
- More than 100 billion brain cells called neurons
- Connections more important than number

Neurons

- Nucleus directs activity inside cell (electrical)
- Axon sends messages to other cells (chemical)
- Dendrites receives messages from other cells (chemical)

Neurotransmission:

- The transfer of a message from axon of one cell to the dendrite of another
- Many connector points in both axon and dendrite so neuron receives and sends many messages at a time.
- No contact made between axons to dendrites

Neurotransmission

- Communication through release of chemical substances into the SPACES between the axon and dendrites
- This space is known as the SYNAPSE
- Stimulus enters the brain through senses
- Promptly processed by electrical chemical reactions in a complex network of neurons.

Recall

- When information is recalled, it is instantaneously retrieved from its relative storage area of the brain to form an integrated composition

Cellular Memory Pathway

- Remembering something requires activation of specific networks of neurons to trigger the exact memory while others dormant unless stimulated.
- Activation can be triggered by stimuli randomly or can be consciously cued.

Learners need a sense of control over their learning

- When a learner feels in control, the cortex is fully functional and higher level meaningful learning is possible
- Creativity, analysis, synthesis, planning, and problem solving
- When a learner feels he is not in control, these parts of the brain shut down and the only learning possible is rote memorization or simple learning based on habit or instinct.

Processing Memory Learning

- You can't forget what you never knew.
- Making an Effort to Remember
- Controlling the Amount and Form
- Strengthening Memory
- Allowing Time to Soak In

Interest

- In order to remember something thoroughly, you must be interested in it.
- Prioritizes by value, meaning, and usefulness
- Brain poorly designed for textbook memory
- Semantic memory (academic and profession knowledge) ideas facts, typical exam questions, etc
- Need to find ways to make information relevant

Interest

- Anytime a person's emotions are engaged they are more likely to form a deeper imprint of the event. Excitement, humor, celebration suspense, fear, surprise and other strong emotion stimulate the production of adrenaline while also activating the amygdala.

Must Come Up With Ways to Get Students Interested

- Find a Study Partner
- Get to Know the Professor
- Do Extra Practice or Research
- Teach an Assignment to Someone
- Seek Ways to Make Personal
- Find Ways to Make It Kinesthetic
- Engage Emotions

Intent to Remember

- Attitude has much to do with whether you remember something or not. A positive attitude that you will remember is a key factor to remembering.
- Learning is different from attention. But if we are not attending, we aren't learning.
- If the information does not get enough attention or if is ³not deemed necessary for long term memory, it will be encoded in short term memory only and ultimately discarded and reclassified.

Intent to Remember

- Mental States are affected by thoughts-mental pictures, feelings
- Physiology<posture, breathing gestures, digestion, temperature
- For learning, students must be in the appropriate state for learning.

Intent to Remember

- Positive attitude can change the brain in at least three ways:
- It alters the chemistry of the brain with the production of dopamine, the feel-good neurotransmitter.
- It increases the noradrenalin, which provides physical energy.
- Constructive thinking activates the frontal lobes, which are most responsible for long-term planning and judgment

Getting It Right the First Time

- You could increase the probability that you get it right the first time by getting enough sleep, eating a high protein breakfast, limiting your caffeine intake, and eliminating as many distractions as possible.
- You can increase the oxygen supply to your brain by paying attention to your posture and breathing
- Physical activity can also increase the blood flow and the brain's oxygen supply.
- Taking Notes. Asking Questions. Predicting Test Questions
- Charging Up Emotionally

Basic Background

- Your understanding of new material depends to a great degree on how much you already know about the subject. The more you increase your basic knowledge, the easier it is to build new knowledge on this background.
- Remember it is cellular connections building on one another that activate learning, consciousness, intelligence, and memory.
- The more learning, the more connections you make.
The greater the number of connections in the brain, the greater the meaning derived from learning

Intent to Remember

- If there is not a neural network for something, it simply doesn't exist in our brain.
- This is why totally *new* concepts are so difficult to grasp at first.
- When you activate what you already know about a subject before learning something new, the brain actually makes more connections.

Build as Much Background

- Before Reading an Assignment, Preview It
- Survey Title and Headings, Study the Pictures and Charts
- Read the Summary
- Familiarize Yourself With Study Questions
- Try to Recall What You Already Know
- Look for Patterns

Building Background

- Students Read Assignments BEFORE Going to Class
- Do All Homework Assignment and Readings
- Begin With Basic Level Courses
- Do Extra Research
- Explore the Internet
- Create Ways to Experience the Subject

Selectivity

- Determine what is most important and select those parts to study and learn.
- Most students are drowning in information and starved for meaning.
- Because of the tremendous volume information you encounter (millions of bits of random information per minute, information) it is crucial that you consciously cue into your memory system.

You Can't Remember Everything About Everything

- Look for Clues When Reading--Bold Print, Headings, Summaries, Review Questions.
- Look for Clues During Lecture--Verbal Clues Such As Emphasis and Repetition
- Pay Attention to Non-verbal Clues
- Make Yourself the Test Maker, Make Flashcards

Meaningful Organization

- You can learn and remember better if you can group ideas into some sort of meaningful categories or groups.
- To form a sharp memory of something original information must be encoded accurately
- Maintained or strengthened over time
- Triggered by association or cue.

When information is poorly encoded there is no hope for data recovery.

Information Must Be Organized If You Have Any Hope of Finding It Again

- Search for Ways to Organize in Categories That Are Meaningful to You
- Alphabetize a List
- Use Mnemonic Devices
- Use a Set Sequence
- Set it to Music
- Look for Patterns

Processing Memory

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Recitation

- Saying ideas aloud is probably the most powerful tool you have to transfer knowledge from short-term to long-term memory.
- The more senses we use the stronger the neural trace.
- The more feedback we get, the faster and more accurate our learning is.
- Recitation is where the difference in understanding something and knowing become most apparent

Recitation

- Seeking feedback is a natural and essential learning tool that helps us minimize false impressions before inaccurate memories are formed.
- More Than Repeating Out Loud.
- Saying Out Loud in Your Own Words

Recitation Works for Several Reasons

- When you know you are going to recite something in your own words, you pay more attention
- You get immediate feedback.
- You are using many parts of the brain

Visualization

- Make a mental picture of what needs to be remembered. By visualizing, you use an entirely different part of the brain than you do by reading or listening.
- 90% of the brain's sensory input is visual.
- The brain's quickest response is to color, motion, form and depth.
- The brain has an attentional bias for high contrast and novelty.
- The brain has an immediate & primitive response to symbols, icons & simple images.

Words are processed on the Left-- Pictures on the Right side of the Brain.

- Use Both sides!
- Pictures Usually Stay Longer and We Can Remember More.
- No Matter How Abstract, Make Mental Videos Using Color and Action.
- Will It Convert to a Chart?
- Can I Draw It Out??

Association

- Memory is increased when facts to be learned are associated with something familiar to you.
- Association is central to the process of encoding and retrieval
- Extremely important to encode new information consciously
- Optimal learning occurs when the brain's multiple maps work in synchronization or network with each other.
- The more connected these neural networks are, the greater the meaning derived from learning.

Recalling Something You Already Know and Making a Link to the Brain File² That Contains That Information

- Is This Like Something I Already Know?
- Is the Number Similar? Is the Sound Similar?
- Can I Use It for Something Similar?
- If I Were Filing It in My Brain's Filing Cabinet, Is There an Existing File I Can Use Instead of Creating a New One?

Consolidation

- Your brain must have time for neural traces to become secure, firm, and strengthened. When you make a list or review right after class, you are using the principle of consolidation.
- Brain is not designed for nonstop learning.
- As the brain learns new information, new connections are formed.
- Learning is a biological process that literally changes the configuration of brain.
- Processing time is necessary to build the inner wiring necessary for connectivity and recall.
- Repetition of information strengthens new connections

Three criteria necessary for this are

- Reinforcing in your preferred modality (visual, auditory or kinesthetic)
- Reinforcing the right number of times
- For some once, for others it may be 20 times
- Reinforcing a sufficient length of time (a couple of seconds to several hours).

New Information Takes Time to Soak In

- Take Notes in Class
- Ask Questions in Class
- Review Notes
- Stop After Reading Each Paragraph. Write a Question in Margin and Recite Answer
- Visualize
- Recite
- Flashcards
- Practice Tests

Distributed Practice

- A series of shorter study sessions distributed over several days is preferable to longer study sessions on fewer occasions.
- Short sessions, more often, create growth of dendrites and connections exponentially
- Studies have shown that the body is going to take ³down time² whether we give it or not.

Several Short Sessions Usually Better Than One Long Sessions

- Take 10 Minute Breaks After Each Hour of Study
- Review What You Just Learned Before You Begin Again
- Have a Scheduled Time to Study Each Subject
- Make Use of Daylight Hours and Time You Normally Waste
- Use Flashcards
- Study Immediately Before and After Classes
- Mark Each Paragraph of Your Textbook With a Question or Label.
- This way you can read bits and pieces and put them together when you've finished
- Use the Label in the Margin System for Notes

Principles for Optimal Learning and Brain Compatible Strategies For Memory and Learning

www.mtsu.edu/~studskl/memppt.htm

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