The Adolescent Brain –Learning Strategies & Teaching Tips

Learning Strategies Thing to Know

1: A young adolescent brain can hold seven items of information, plus or minus two items, in working memory.

• An effective strategy that allows teenagers to work with larger and larger amounts of information is to show them how the information fits together. For example- which list can you recall with more accuracy: NB CLA XC BSD VDA BC or NBC LAX CBS DVD ABC? You can recall the entire second list even though the number of letters and the letters themselves were the same and in the same order because you were able to see how the letters could fit together in a more meaningful way. NBC is now a single item of information, as is LAX and so on.
• Short-term memory stores about 7 pieces of information for about 30 seconds. If the information is not easily remembered through chunking or other strategies, it will be quickly forgotten.
• Working memory stores about 7 pieces of information for 20 to 30 minutes. If the brain does not determine the information to be meaningful, it is not stored in long-term memory and is lost.
• Use Brain Compatible Strategies such as Chunking, Storytelling, Mnemonics, and Rhythm, Rhyme, and Rap.

Thing to Know # 2: The addition of emotion can help students remember. • Emotion drives attention and attention drives learning.

• The young adolescent brain does not have a fully developed frontal lobe (which houses higher-level thinking) so many times the thinking gets accomplished by the amygdala (which typically stores emotional memory).
• Emotion can also work against learning – no learning occurs if a student feels threatened. Something as simple as being called on to answer a question or asked to read aloud can produce a threatening situation for some students.
• Use humor not sarcasm when teaching. Be careful with humor – you do not want to offend any student. Use yourself as the "brunt of the joke."
• Use Brain Compatible Strategies such as Wait Time, Think-Pair-Share, and Reading Buddies to reduce stress. • Use Brain Compatible Strategies such as Storytelling and Rhythm, Rhyme, and Rap to make an emotional connection.

Thing to Know # 3: The brain is social & requires interaction in order to develop properly.

• The brain's primary function is to promote survival of the body. Hundreds of years ago, a person stood a better chance of surviving as a member of a group versus as an individual. Thus, humans have evolved into social beings and require social interaction in order to mature appropriately.
• Use Brain Compatible Strategies such as Think-Pair-Share, Simulations, and Reciprocal Teaching.

Thing to Know # 4: Practice/rehearsal is critical to learning for the long term.

• Understanding must be checked frequently to ensure that the rehearsal is correct. This can be accomplished simply by asking questions such as "What do I need to clarify?" or "What questions might you have?"
• Use of the Socratic Teaching method (asking the audience questions) will allow feedback and verification of understanding. For example, you could ask, "I just used the word "asymmetry" -- can anyone tell me what that means?" • Use Brain Compatible Strategies such as Analogy, Metaphor and Simile, Simulations, Storytelling, and Rhythm, Rhyme, and Rap

Thing to Know # 5: We take in more information visually than through any other sense.

• We have a tremendous capacity to store pictures in long term memory.
• Use Brain Compatible Strategies such as Visuals & Graphics, Storytelling, and Hands-on activities.

Brain Compatible Strategies for Increasing Learning

Storytelling

• Can be real or fictional.
• Should be age- and experience-appropriate.
• Makes an emotional connection to the audience. Reciprocal Teaching – Think, Pair, Share • Use anytime you have asked for individuals in a group to make a response, i.e. answer a question, give an opinion, etc.
    o Make your request.
    o Tell participants to think about their response.
    o Now tell them to turn to their neighbor and discuss their responses.
    o Ask for volunteers to share what they heard - they can share their own response or that of their discussion partner.
• You tend to get more students willing to respond and the responses are richer. Metaphor, Analogy and Simile

• This makes the connection between something students are already familiar with and the new information.
• For example, when dealing with statistical information that has large numbers, try to convert those numbers into smaller more concrete statistics: “Presently, one out of five people will develop skin cancer by the age of 65. This means that at least six students in this class of 30 will have skin cancer at some point in their life.”

Visuals/Graphics

• A picture is worth a thousand words.
• Have the students visualize an image and connect it to them personally: “Imagine that…”, “Close your eyes and picture …”, “What do you see when I say …”
• Graphics don’t necessarily mean graphs - use cartoons, diagrams, simple flow charts, etc. Mnemonics
• A good tool to help us remember seemingly disconnected items of information.
• Roy G. Biv is a mnemonic to help us remember the colors of the visible light spectrum in order – Red, Orange, Yellow, Green, Blue, Indigo, and Violet.
• ABC’s of Melanoma are a mnemonic for remembering what to look for in a skin spot.
• This is more powerful if the students are the ones to create the mnemonic. Hands-on / Simulations • Another opportunity for visual and emotional connections. • Be sure your instructions and expectations are clear.
• The majority of students are visual learners, a large minority are tactile/kinesthetic learners and a very small number of students are auditory learners.
• Does not need to be complex – something as simple as putting your hand into a fist to show the approximate size of your heart is a simulation.

Wait Time

• Give students time to process your question before asking for a response. Waiting between 5 and 10 seconds before calling on students will increase the number of hands-up and the quality of the answers. Rhythm, Rhyme, and Rap
• Putting information to music or a rhyme can increase memory – how did you learn the alphabet in the right order?
• You can have these already prepared or challenge the students to do this.

Chunking

• A chunk is any coherent group of items of information that we can remember as if it were a single item. This is why a mnemonic device works. Chunking works best when information is limited to 9 pieces of information or less.
• For example, remembering the 12 cranial nerves is both difficult and longer than remembering 9 nerves. So, we use two devices: a mnemonic that chunks or separates a large amount of information into smaller phrases and arranges the information in an easy to remember sequence. “On Old Olympus Towering Top A Famous Vocal German Viewed Some Hops” lets us remember both the order and first letter of each cranial nerve. Another example is listed under Things to Know #1. By chunking the letters into phrases we remember like IBM and TWA, it is easier to remember the entire list of letters