INTEGRATED THEMATIC INSTRUCTION

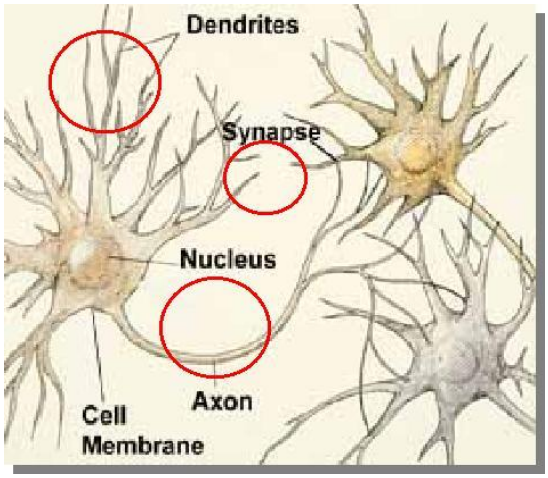
Brain-Compatible Learning versus Brain-Antagonistic Learning:

How does learning occur?

Actually, in several ways, two of which we'll discuss here:

- The first is linear, one-step-at-a-time. Break down the process into small, step-by-step procedures. Here are some examples from reading and math:
  - 1) Learn the sounds of the letters of the alphabet, and then begin to put them together to form words.
  - 2) Learn the basic addition facts, and then use the facts to solve simple addition problems.
- Some learning tasks lend themselves to a holistic brain model. We call this integrated, thematic learning. Each new piece of information can connect with a previously learned piece of information until the knowledge acquired is organized by the brain into schemas (think schematic) that provides high levels of understanding and retention. The human brain needs both step-by-step and holistic learning.

Let's talk about integrated learning by looking at the human brain:



The cells of the brain are called *neurons.* The neurons communicate with one another across little gaps called *synapses.* As the brain learns, it literally develops little extensions to each brain cell called *dendrites.* In integrated learning, new information easily connects with the dendrites of old information. It becomes part of the schema surrounding that theme.

Just look at the illustration above and try to find the linear process here. You won't. Learning is messy! We only learn what the brain perceives as necessary.[1] It learns best when new information is connected to already existing information. Dr. Fred Jones in his landmark series, *Tools for Teaching,* is quoted as saying, "You either teach to the brain the way it is made or you don't teach." Learning does not take place out of confusion.

I like to picture the new learning as a little ring of information. If a similar peg is present, the new learning has a place to go, new dendrites are formed and the new information has a high likelihood of being retained in the memory.

If the peg is not there, the information might roll around in the head awhile (maybe even long enough to "pass the test") but it will then be forgotten. It simply had no place to go! That is one reason I oppose the *teaching-to-the-test* model of education that has developed around high stakes, standardized testing. It rarely produces true understanding and long-term learning.

Whether one is teaching step-by-step or holistically, new learning must have a connection to information already in the brain. Less than that, it produces frustration and is brain-antagonistic rather than brain compatible. Step-by-step learning can be compared to building a house. It best occurs when the teacher provides the foundation and checks for understanding before going on the next *brick!* Spalding Reading and Saxon Math are good examples of this type of learning.

<table>
<tr><td colspan="2">Add New Information</td><td colspan="2">Add New Information</td><td>Add New Information</td></tr>
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<tr><td colspan="5">Build a Solid Foundation</td></tr>
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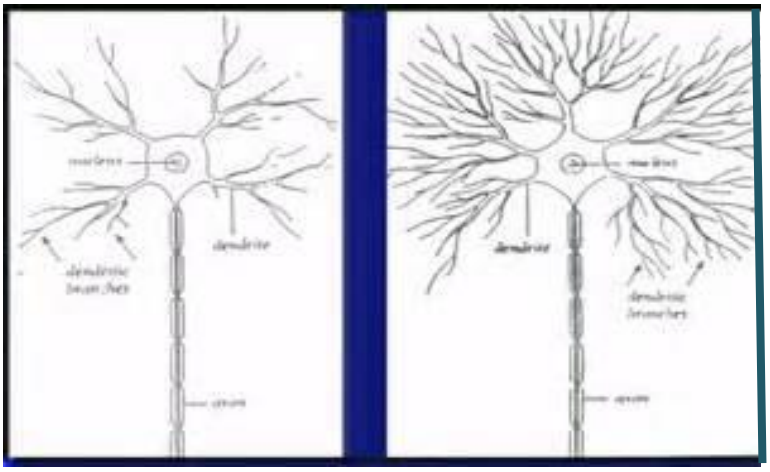
[1] [1] Retrieved from http://www.witchhazel.it/brain_learning.htm

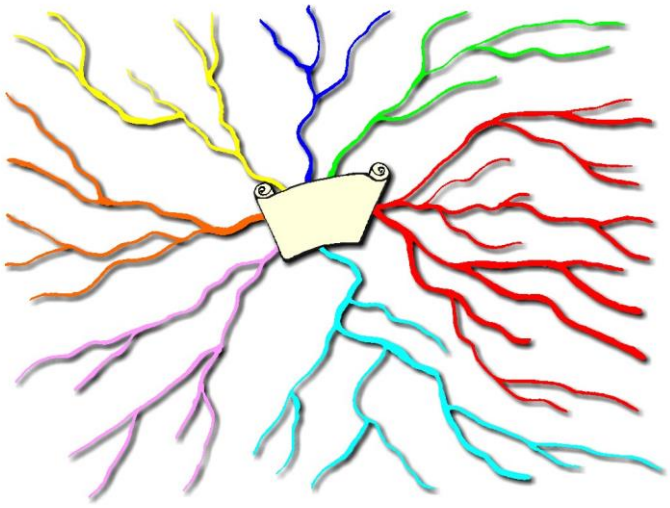
Let's talk a minute about memory itself. Memory is made up of three steps or processes, each impacting a different place in the brain:

- **Short-term memory** is like remembering someone's name or phone number for a few minutes. Verbatim recall is about 2 short declarative sentences. Much beyond that and the concept is lost. Think of the last time someone told you a phone number and you'd forgotten it within about 30 seconds!
- **Medium-term memory** is what kids use to remember the items on a weekly quiz or you the items on a grocery list. It is a little longer lasting, but still not the ultimate goal of learning. For that, you need long-term memory.
- **Long-term memory** includes those things that you remember months and even years later because new schemas have been developed. These then become the "pegs" upon which later learning can hang. Long term learning happens best when things are presented in a meaningful way and connected to existing schema developed earlier.

Integrated, Thematic Instruction is a model that teaches to the way the brain learns. It begins with a central theme. Related topics are then added to this theme in a connected and meaningful way. Learning experiences are designed around the theme. The core academic skills are integrated into the whole as they teach to the theme – reading, math, social studies, science, music, and art – even P.E. and recess on occasion! Students work with the different topics, using many academic skills, in an integrated fashion. New information is "hung" on existing pegs, creating dendrites which then become the "pegs" for additional information. The learning process is structures, but not broken up into strict periods (which often cuts short learning that is just taking root), but continues until the task is complete and a logical stopping place has been reached.

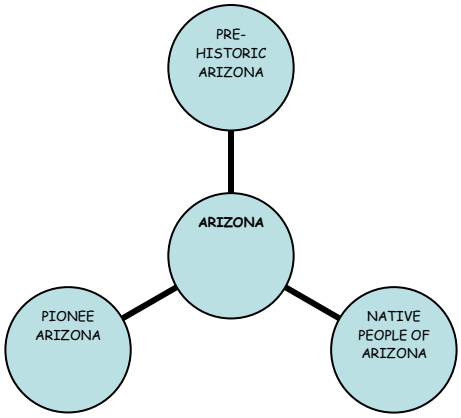


This illustration shows the difference between the dendrites of a cell coming from a cognitively poor environment to those coming from an enriched environment



Above is an illustration of a mind map. It not only reminds me of the neuron with its dendrites, but it is a great planning tool for organizing Integrated Thematic Instruction. The Central Theme is like the neuron and the learning activities that teach to that them are like the dendrites.

For example, 4th grade Social Studies focuses on the topic of state – in this case, Arizona. Here is a possible beginning of a mind map of a 4th grade integrated curriculum with a central theme and three sub-themes (the fourth sub-theme, Modern Arizona, is not pictured):



The core theme is "Arizona". A sub-theme is "Prehistoric Arizona". Topics of study include the Petrified Forest – where the student explores rocks, fossils, the National Park System, careers in geology and paleontology, etc. Studies integrate the academic areas of science, math, social studies, reading, written language, computer skills, art, and career awareness.

For further information on how the brain learns, you may want to visit these sites:
http://www.witchhazel.it/brain_learning.htm; http://braincompatible.ascd.org/: http://eduscapes.com/tap/topic;
http://www.loloville.com/brain_based_learning.htm