LANDMARK SCHOOL OUTREACH PROGRAM
SPOTLIGHT
ON LANGUAGE-BASED TEACHING
CLASSROOM

Landmark Teaching Principle™ #1

Provide Opportunities for Success

Three Types of Memory

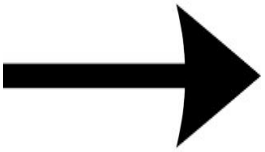
There are three types of memory: short-term, long-term, and working memory.

Short-Term

Short term memory refers to the storage of a limited amount of information for a limited amount of time. The information stored here is intended for immediate use. The average number of units a person can remember is 7 (+/-2), making an approximate range of 6-8 units. There are two general types of short-term memory: verbal and visuo-spatial.

- Verbal short-term memory stores information expressed in the spoken language
- Visuo-spatial short-term memory holds images, pictures, etc.

Long-Term



Long-term memory is memory of a longer duration than short-term memory. There are three types which are generally remembered for the longest periods.

- Autobiographical memory refers to personal facts.
- Semantic memory is meaningful facts and a lexicon of language.
- Procedural memory consists of skills and procedures learned through repeated practice and which can be executed automatically.

Working Memory

There are several definitions of working memory, but it essentially represents the ability of a student to hold a small amount of information in short-term memory while working with that information and integrating it with other information (Swanson, 1994). It's a conscious process in which a person considers a stimulus (new knowledge) in terms of attributing sense and meaning to it, based on previous knowledge (Sousa, 2006). Working memory requires manipulation of information and further expects that the person do something with the information just gathered. Generally speaking, working memory requires a lot of **mental juggling**.

Similar to short-term memory, working memory contains two major types: verbal (auditory) and visuo-spatial. **Verbal**, or auditory, memory makes sense of our sound (phonological) system. This is the system that allows students to follow multi-step oral directions as well as learn and language and complete comprehension tasks. **Visuo-spatial** memory allows for visualization and holding new information in the form of pictures.

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Furthermore, working memory contains three distinct processes. The process of **encoding** involves translating a sensory input into some representational form (image, sound, etc) for storage. Next, the process of **storage** refers to the durability of that memory (how long it will be stored and where). Lastly, **retrieval** is the process of recovering the encoded representation of a stimulus from memory, or the process of once again referring to the information that has been stored and using it appropriately. For some students, this set of processes can be overwhelming and extremely challenging.

As stated previously, working memory is a huge indicator for academic success. So much of learning requires students to access directions, information, and materials in a way that allows them to remember what they read/learned and utilize that information to form opinions/compositions. Oftentimes, students with working memory deficits get so bogged down in the remembering and manipulating stage that they are unable to really access the curriculum in an evaluative construct. "Imagine, for example, attempting to read and comprehend a passage of a text. The process of reading sentences, holding them in mind and integrating the information to uncover the meaning relies heavily on the ability to simultaneously process and store information over the short term (Holmes, 8)." Other tasks that rely heavily on working memory are:

- reading fluently and comprehend what was read
- producing or understanding complex sentence length
- remembering a new phone number, pin number, web address, or vehicle registration
- calculating how much a bill might be for food or shopping
- remembering a new or unfamiliar name of someone or something that has just been introduced
- following spoken directions

There is a **limit to the amount of information that we can hold and manipulate in working memory** at any given time. This capacity changes across the lifespan and varies greatly between individuals of the same age. A student with working memory deficits may only be able to hold and manipulate 1-3 units of information, which means their working memory would be overloaded after one to two directions. Check out this video to see how humans compare to primates in their working memory abilities.

HOW IS THIS PROVIDING OPPORTUNITIES FOR SUCCESS?

In order for teachers to create an atmosphere that is conducive to learning for all students, they need to have a clear understanding of how working memory impacts student's ability to hold and remember information. The next issue will focus on strategies for the classroom to help alleviate working memory deficits and allow all students access to the curriculum and instruction.