

Graphic Organizers to the Rescue!



Helping Students Link—and Remember—Information

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How do we remember things?

How do we take advantage of our short-term memory?

How does information get stored for the long term?

Do people remember things in different ways?

What can help students improve their memory of content?

What can teachers do to support students with disabilities in storing long-term memory?

Psychologists and neuroscientists are working on these questions as we read this article, and many answers are ready and waiting for savvy teachers to grab and use with their students.

Students with mild to moderate disabilities need strategies to help them achieve success in their content-area classes. As special education teachers, one of our goals is to ensure, to the best of our ability, that students are achieving success in all classes. If students are to become successful in content-area classes, we must present information in a manner that is clear and organized. A

clear, organized style will assist students in the note-taking process and will help them link the new information to their existing schema of knowledge. Graphic organizers may help as we present new information to students and as we review previous lessons.

What Are Graphic Organizers?

Graphic organizers are “visual displays teachers use to organize information in a manner that makes the information easier to understand and learn” (Meyen, Vergason, & Whelan, 1996, p. 132). Here are some examples of graphic organizers:

- Venn diagrams.
- Semantic webs.
- Genealogical trees.
- Frames.

Some of these examples can be found in works by Lazear (1991) and Staton (1991). The frame is a more detailed type of graphic organizer; Ellis (1998) described its use in the Content Enhancement Series entitled *The Framing Routine*. The frame is a “two-dimensional graphic organizer that allows the teacher to display in an organized manner important information related to the targeted key topic” (p. 5).

The graphic organizer has its roots in schema theory. In effect, schema theory states that *new information must be linked to preexisting knowledge*. The teacher’s task is to ensure that the child has prior knowledge related to the concept and to provide a means to assist the child in making the necessary connections between what is being taught and the child’s prior knowledge. When people learn something new, they must retain it for later use. Our knowledge is stored in a scaffold-like hierarchy, which includes our way of organizing the information. According to Slavin (1991), we encode, store, and retrieve information based on this system. Schema theory can be better understood when we examine the cognitive approach to learning.

“Information that fits into a (student’s) existing schema is more easily understood, learned, and retained than information that does not fit into an existing schema.”

—Robert Slavin

Cognitive Approach to Learning

“The cognitive approach to learning seeks to understand how incoming information is processed and structured into memory” (Weinstein & Mayer, 1986, p. 316). Figure 1, a graphic organizer, illustrates how information is processed through the short-term memory and the long-term memory.

According to cognitive theory, a student is bombarded with a great deal of information. This is what happens (imagine arrows showing choices and processes):

- All this information enters the sensory register and is held there for only a few seconds.
- The information is either processed immediately or is forgotten.
- If the student chooses to process the information, it then moves from the

sensory register to short-term memory.

- At this point, the student must rehearse this newly received information or it will be lost. The rehearsal is important because the longer a piece of information remains in short-term memory and is actively used, the greater the chance that this information will move from short-term memory to long-term memory.

Clearly, this is one of the key points in teaching—helping the student move pertinent information into long-term memory.

According to Slavin (1991) and Mercer (1997), long-term memory can be divided into three parts; procedural memory, episodic memory, and semantic memory.

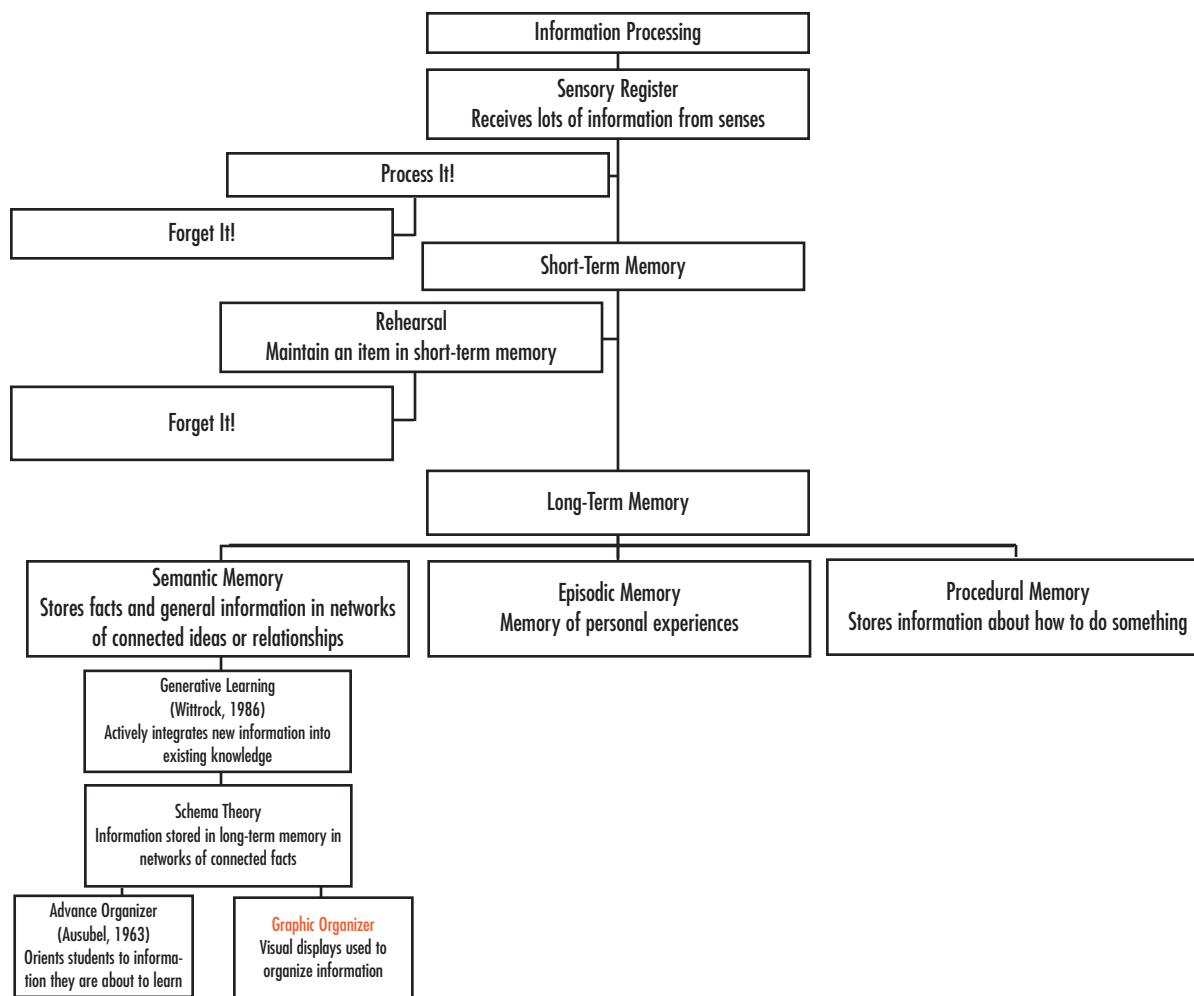
- Procedural memory stores information about how to do something.



Graphic organizers help students achieve success in their content-area classes.

- Episodic memory stores information about personal experiences.
- Semantic memory is organized in a different fashion. Semantic memory stores facts and general information in networks of connected ideas or relationships. This concept of semantic memory is grounded in *generative*

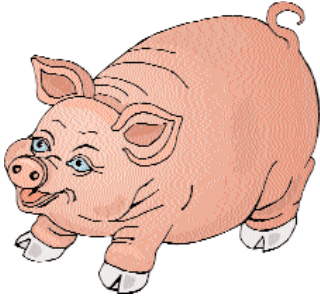
Figure 1. Graphic Organizer: Information Processing



Early Childhood Uses

Here are some ways you may use graphic organizers with children at the early childhood level:

1. Teaching children about animals and helping them classify the animals.
2. Explaining the connection between characters in a story.
3. Developing language skills by including pictures along with the words within the graphic organizer to explain a certain concept.



channels. Clearly, schema theory sets the groundwork for advance organizers (Ausubel, 1963), which, when presented at the beginning of a lesson, orient the students to information that the teacher is about to present. The

graphic organizers are visual displays used to organize information (Meyen et al., 1996). These processes help students integrate the new knowledge into their scaffolds.

Theory Comparison

Let's compare this approach to the behaviorist approach:

- The *behaviorist* approach "focuses on observable behaviors, and views learning as the establishing of functional relationships between a student's behavior and the stimuli in the environment" (Bos & Vaughn, 1998, pp. 55-56).
- The *cognitive* approach "focuses on what happens in the mind, and views learning as changes in the learner's cognitive structure" (Bos & Vaughn, 1998, p. 56).



Simply stated, the behaviorist approach focuses on the behaviors of the teacher and the student; and the cognitive approach focuses on the internal thinking processes of the student.

Application of Schema Theory to Children

The most critical component of schema theory to remember is as follows: "Information that fits into a (student's)

Middle School Uses

Here are some ways to use graphic organizers with middle school students:

1. Illustrating science concepts, such as how and when various types of clouds form.
2. Understanding history concepts, such as the key issues leading to the Civil War.
3. Associating the instruments in an orchestra with the particular section that instrument might be in. One section of the graphic organizer might be entitled "woodwind instruments," with the specific instruments noted.

existing schema is more easily understood, learned, and retained than information that does not fit into an existing schema" (Slavin, 1991, p. 164). If, for example, a student with a disability has difficulty learning information in a content-area class, one might ascertain, based on this schema theory, that the student may have a problem fitting the information he or she has learned into his or her existing scaffold of knowledge. Although there are many reasons for this, one explanation could be that the student may not have the proper background knowledge. As Ausubel (1963) explained it: "Potentially meaningful material is always learned in relation to an existing background of rele-

learning (Wittrock, 1986), which states that if learners are to discover or truly understand the new information, they must actively integrate this new information into their existing knowledge.

Schema Theory

Schema theory explains this integration even further. Schema theory states that a person takes this new information and stores it in preexisting hierarchies or

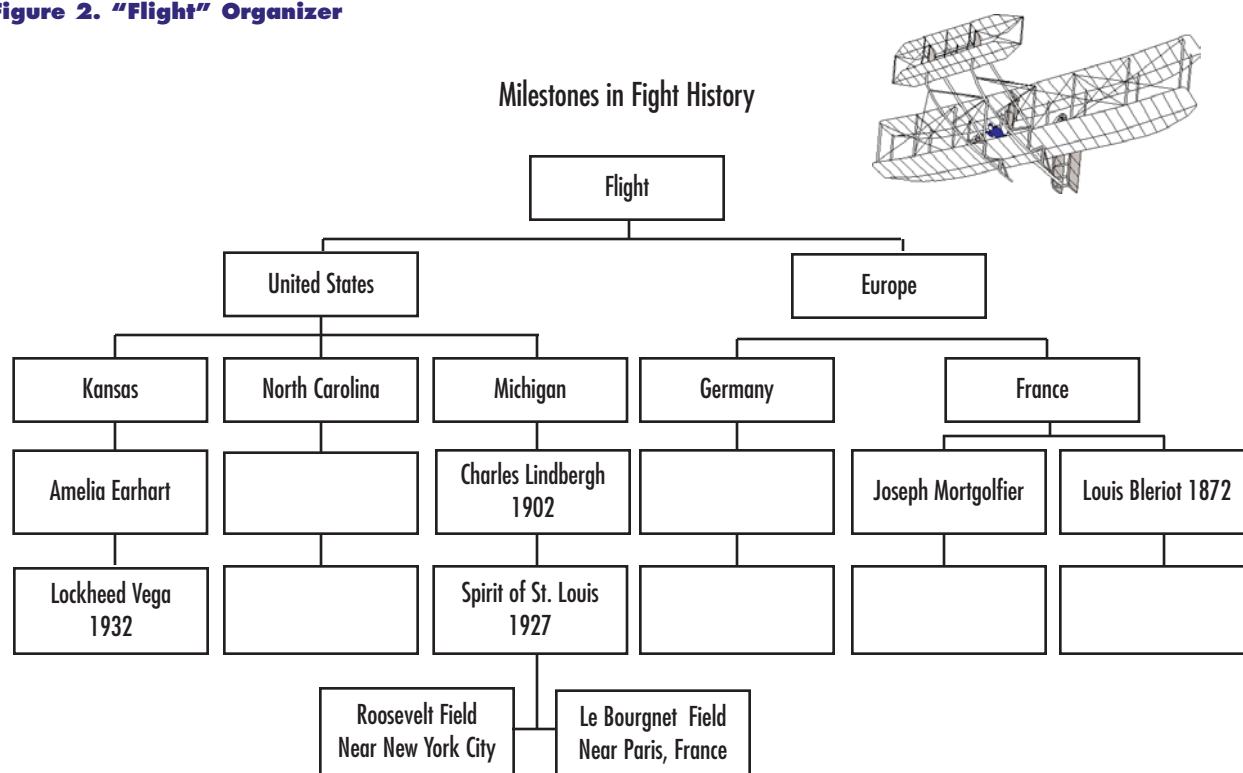
Elementary Uses

Here are some ways you might use graphic organizers with children at the elementary level:

1. Helping children remember or understand the specific parts of a story.
2. Using phonological awareness activities, teaching the children how and when to spell the various /s/ sounds, for example.
3. Helping the children remember the states and capitals and where they are located in the United States. For example, the eastern states, the western states, the midwestern states.



Figure 2. “Flight” Organizer



vant concepts, principles, and information which provide a framework for its reception” (p. 76).

We know that most students with learning disabilities have difficulties processing information; thus, “the most fundamental characteristic of students with learning disabilities is their lack of academic achievement in one or more areas” (Turnbull, Turnbull, Shank, & Leal, 1999, pp. 126-127). Given the lack of background knowledge and the inability to organize the information, it may be difficult for a student with learning disabilities to retain this newly learned information.

Helping the student link new information to an existing knowledge base is one way teachers can assist students in learning new information in content-area classes. The use of a graphic organizer is an underlying premise of schema theory. Understanding this theory can assist teachers in their presentation of the material and may help students make the necessary linkages for learning to occur (U.S. Department of Education, 1987).

If, for example, you were conducting a lesson about flight, you might use the graphic organizer shown in Figure 2. You could help students link concepts of flight to their existing knowledge base by organizing the relationships among topics in the graphic organizer.

Using this graphic organizer to present information about flight, you can help students compare some of the early attempts at flight made by people in the United States with the early attempts at flight made by Europeans. You can also add additional spaces for students to fill out, as seen by the blank spaces in Figure 2 under North Carolina, Germany, Montgolfier, and Bleriot. Students might add information about the Wright Brothers, for example, in the North Carolina box, to continue to develop the lesson about flight.

By using a graphic organizer like the “flight” organizer, students can have a copy of the information and can add to it as the instruction progresses. Similarly, you might add additional blanks under various levels to extend the amount of information you wish to

present to the students on that topic. This also would assist the student in linking prior knowledge with the new information you present.

Creating Your Own Graphic Organizer

Graphic organizers are relatively easy to create; they can enhance a student’s understanding of many lessons. Here are four basic steps to follow:

1. Select the information you intend to present to the students. This may be

High School Uses

Here are some ways to use graphic organizers with high school students:

1. Comparing two stories in literature.
2. Explaining the key components from a chapter in the history text.
3. Describing the key concepts from a chapter in the science text.

New information must be linked to preexisting knowledge.

a chapter, or a story, or a certain concept.

2. Decide what key components are necessary for the students to learn.
3. Create a graphic representation of that information, such as those illustrated in Figures 1 and 2. Your graphic chart should identify the key concepts or components and help illustrate the linkages among the key elements of the concept.
4. Help the students see the connections by examining the information in the graphic organizer.

Graphic organizers lend themselves to many different kinds of content and to uses with all age levels of students (see boxes on Early Childhood,

Elementary, Middle, and High School uses).

Final Thoughts

Graphic organizers can benefit teachers, students, and parents. By using graphic organizers, teachers can have a clear understanding of what they want to address in their classes. Graphic organizers provide students with a road map to follow as they expand their schemas by linking them to existing knowledge. When looking at a graphic organizer, like the "Flight" organizer, parents can have a clearer view of what their children will learn or what they have learned in a content-area class. By serving as a means of helping students link the new information with their existing knowledge base, graphic organizers can contribute to our ultimate goal—student learning.

References

Ausubel, D. P. (1963). *The psychology of meaningful verbal learning*. New York: Grune & Stratton.*

- Bos, C. S., & Vaughn, S. (1998). *Strategies for teaching students with learning and behavior problems* (4th ed.). Needham Heights, MA: Allyn & Bacon.*
- Ellis, E. S. (1998). *The framing routine*. Lawrence, KS: Edge Enterprises.*
- Lazear, D. (1991). *Seven ways of teaching*. Palatine, IL: Skylight.*
- Mercer, C. D. (1997). *Students with learning disabilities*. Upper Saddle River, NJ: Prentice Hall.*
- Meyen, E. L., Vergason, G. A. & Whelan, R. J. (1996). *Strategies for teaching exceptional children in inclusive settings*. Denver, CO: Love.*
- Slavin, R. E. (1991). *Educational psychology* (3rd ed.). Needham Heights, MA: Allyn & Bacon.*
- Staton, H. N. (1991). *The content connection: How to integrate thinking and writing in the content areas*. Glenview, IL: Goodyear Books.*
- Turnbull, A., Turnbull, R., Shank, M., & Leal, D. (1999). *Exceptional lives: Special education in today's schools* (2nd ed.). Upper Saddle River, NJ: Merrill, Prentice Hall.*
- U.S. Department of Education. (1987). *What works* (2nd ed.). Washington, DC: U.S. Government Printing Office.
- Weinstein, C. E., & Mayer, R. E. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (pp. 315-327). New York: Macmillan.
- Wittrock, M. C. (1986). Students' thought processes. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed.). New York: Macmillan.*

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