



The
Access Center
Improving Outcomes for All Students K-8

USING MNEMONIC INSTRUCTION TO TEACH SCIENCE

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What Is Mnemonic Instruction?

Mnemonic instruction is a set of strategies designed to help students improve their memory of new information. Mnemonics instruction links new information to prior knowledge through the use of visual and/or acoustic cues. These strategies have been proven effective with students at a wide range of ability levels (gifted, normally achieving, and those with mild and moderate disabilities) and at all grade levels. Mnemonics are particularly helpful in teaching students with disabilities who have difficulty recalling verbal and content-area information, as they are effective with any type of verbal content.

There are three basic types of mnemonic strategies:

- **Keyword** – A keyword is a familiar word that sounds similar to the word or idea being taught. Keywords are generally used with an illustration of some type. The teacher creates a picture or other graphic that links the old and new information in the student's memory. For example, a mnemonic for remembering the definition of the word "carline" (meaning witch) might be a drawing of a witch driving a car.
- **Pegword** – Pegwords refer to a set of rhyming words that are used to represent numbers. For example, the pegword for "one" is "bun." Pegwords are used to help students remember information involving numbers or other information in a particular order.
- **Letter** – Letter strategies include acronyms and acrostics (or sentence mnemonics). For example, the acronym **HOMES** can be used to help students remember the names of the Great Lakes (Huron, Ontario, etc.). Acrostics are sentences in which the first letters of the words correspond to the first letters of the information students are expected to remember. For example, "**Every Good Boy Does Fine**" is commonly used to help music students remember the notes on the lines of the treble clef.

What does it look like for science?

All three types of mnemonic strategies can be used effectively in teaching a variety of science content at differing grade levels to students with either mild or moderate disabilities. The following examples use each of the three types of strategies and illustrate their effective use in different areas of science at various grade levels. These examples illustrate the use of mnemonics for science subject matter as varied as the human body, insects, levers, and the colors of the rainbow.

How is it implemented?

In teaching new content, good teachers not only tell their students what is important to remember, they give them ways to remember it. Teachers must:

- ◆ Create the mnemonics themselves and must be explicit in their instruction, telling students, for example, “[H]ere is a good way to remember this.”
- ◆ Go through the specific steps involved in using the mnemonic to show students how to use it to retrieve information.
- ◆ Practice all the steps of the strategies with the students, until they can practice them independently and retrieve the information correctly.

See the references at the end of this brief for resources on combining mnemonics, using them with varying levels of student independence and teacher support, and using them with other teaching techniques.

There is no need to be an accomplished illustrator to create the illustrations or other graphics used in some mnemonics. Simple drawings or clip art can be used, as in the example below. Most word-processing software offers a wide selection of clip art, and there are Web sites offering free or inexpensive clip art. And most mnemonics can be used without pictorial illustrations. The references at the end of this brief provide some sources teachers can use in developing mnemonics and accompanying illustrations.

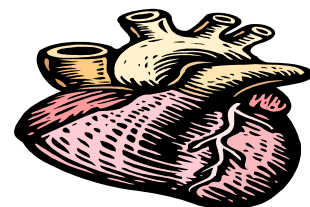
Keyword Strategy

The keyword strategy is based on linking new information to keywords that the students already know. This strategy can be used to teach new words or concepts. By linking the new word or concept to existing “keywords,” the student can recall the new information more easily. The teacher also connects the keyword with a visual cue by either providing a picture or having students visualize an image.

Example of Keyword Strategy

Word	Keyword	Strategy
Vein	In	The blood flows into the heart
Artery	A	The blood flows away from the heart

The teacher would provide a picture which illustrates the blood flow to and away from the heart.



Pegword Strategy

The pegword strategy uses a consistent set of rhyming words to represent numbers or order, which are matched to visual images. The pegword is substituted for the number to be remembered and the student associates the picture with the information. For example, the pegword for two (or second) is shoe. When ordered or numbered information needs to be remembered, the pegword strategy can be useful. See below for examples of this strategy in teaching science.

How to Teach the Pegword Strategy

To remember insects have six legs, make a picture of an insect on sticks (pegword for six).

To remember spiders have eight legs make a picture of a spider on a gate (pegword for 8).

To remember a rake is an example of a third class lever, create a picture of rake leaning against a tree (pegword for three).

Pegwords for Numbers

One is **bun**
Two is **shoe**
Three is **tree**
Four is **door**
Six is **sticks**
Seven is **heaven**
Eight is **gate**



Letter Strategy

As shown above, letter strategies involve the use of acronyms or acrostics (sentence mnemonics). Acronyms that are effective in teaching the colors of the rainbow include **ROY G. BIV** or **Richard of York Gave Battle in Vain**. This strategy works well with a variety of mild and moderate disabilities and in varying grades.



Example of Letter Strategy in Teaching Colors of a Rainbow

R — Red
O — Orange
Y — Yellow
G — Green
B — Blue
I — Indigo
V — Violet

Richard — Red
Of — Orange
York — Yellow
Gave — Green
Battle — Blue
In — Indigo
Vain — Violet

References

Ehren, Barbara J. (2005). *Mnemonic Devices*. University of Kansas Center for Research on Learning. http://itc.gsu.edu/academymodules/a304/support/xpages/a304b0_20600.html

Ellis, Edwin (1993). Integrating Strategy Instruction: A Potential Model for Teaching Content Area Subjects to Adolescents with Learning Disabilities. *Journal of Learning Disabilities* 26, 6, 358-383.

Scruggs, T.E. & Mastropieri, M. A. *Teaching Tutorial: Mnemonic Instruction*. www.teachingld.org

Other Web Resources

Alert 5: Mnemonic Instruction. www.teachingld.org

www.allfree-clipart.com

For additional information on this or other topics, please contact The Access Center at accesscenter@air.org.

We also would like to draw on your expertise and experiences in providing access to the general education curriculum. Please share your experiences and success stories with the Access Center by sending them to the address or e-mail below.

We look forward to hearing from you.

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