

## General guidelines to improve memory

In addition to exercising your brain, there are some basic things you can do to improve your ability to retain and retrieve memories:

1. **Pay attention.** You can't remember something if you never learned it, and you can't learn something — that is, encode it into your brain — if you don't pay enough attention to it. It takes about eight seconds of intent focus to process a piece of information through your hippocampus and into the appropriate memory center. So, no multitasking when you need to concentrate! If you distract easily, try to receive information in a quiet place where you won't be interrupted.
2. **Tailor information acquisition to your learning style.** Most people are visual learners; they learn best by reading or otherwise seeing what it is they have to know. But some are auditory learners who learn better by listening. They might benefit by recording information they need and listening to it until they remember it.
3. **Involve as many senses as possible.** Even if you're a visual learner, read out loud what you want to remember. If you can recite it rhythmically, even better. Try to relate information to colors, textures, smells and tastes. The physical act of rewriting information can help imprint it onto your brain.
4. **Relate information to what you already know.** Connect new data to information you already remember, whether it's new material that builds on previous knowledge, or something as simple as an address of someone who lives on a street where you already know someone.
5. **Organize information.** Write things down in address books and datebooks and on calendars; take notes on more complex material and reorganize the notes into categories later. Use both words and pictures in learning information.
6. **Understand and be able to interpret complex material.** For more complex material, focus on understanding basic ideas rather than memorizing isolated details. Be able to explain it to someone else in your own words.
7. **Rehearse information frequently and “over-learn”.** Review what you've learned the same day you learn it, and at intervals thereafter. What researchers call “spaced rehearsal” is more effective than “cramming.” If you're able to “over-learn” information so that recalling it becomes second nature, so much the better.
8. **Be motivated and keep a positive attitude.** Tell yourself that you *want* to learn what you need to remember, and that you *can* learn and remember it. Telling yourself you have a bad memory actually hampers the ability of your brain to remember, while positive mental feedback sets up an expectation of success.

## Mnemonic devices to improve memory

Mnemonics (the initial “m” is silent) are clues of any kind that help us remember something, usually by causing us to associate the information we want to remember with a visual image, a sentence, or a word.

Common types of mnemonic devices include:

1. **Visual images** - a microphone to remember the name “Mike,” a rose for “Rosie.” Use positive, pleasant images, because the brain often blocks out unpleasant ones, and make them vivid, colorful, and three-dimensional — they’ll be easier to remember.
2. **Sentences** in which the first letter of each word is part of or represents the initial of what you want to remember. Millions of musicians, for example, first memorized the lines of the treble staff with the sentence “Every good boy does fine” (or “deserves favor”), representing the notes E, G, B, D, and F. Medical students often learn groups of nerves, bones, and other anatomical features using nonsense sentences.
3. **Acronyms**, which are initials that creates pronounceable words. The spaces between the lines on the treble staff, for example, are F, A, C, and E: FACE.
4. **Rhymes and alliteration**: remember learning “30 days hath September, April, June, and November”? A hefty guy named Robert can be remembered as “Big Bob” and a smiley co-worker as “Perky Pat” (though it might be best to keep such names to yourself).
5. **Jokes** or funny associations using facts, figures, and names you need to recall, because funny or peculiar things are easier to remember than mundane images.
6. **“Chunking” information**; that is, arranging a long list in smaller units or categories that are easier to remember. If you can reel off your Social Security number without looking at it, that’s probably because it’s arranged in groups of 3, 2, and 4 digits, not a string of 9.
7. **“Method of loci”**: This is an ancient and effective way of remembering a lot of material, such as a speech. You associate each part of what you have to remember with a landmark in a route you know well, such as your commute to work.

## Healthy habits to improve memory

Treating your body well can enhance your ability to process and recall information.

### Healthy Habits that Improve Memory

- Regular exercise**
  - Increases oxygen to your brain.
  - Reduces the risk for disorders that lead to memory loss, such as diabetes and cardiovascular disease.
  - May enhance the effects of helpful brain chemicals and protect brain cells.
  
- Managing stress**
  - Cortisol, the stress hormone, can damage the hippocampus if the stress is unrelieved.
  - Stress makes it difficult to concentrate.
  
- Good sleep habits**
  - Sleep is necessary for memory consolidation.
  - Sleep disorders like insomnia and sleep apnea leave you tired and unable to concentrate during the day.
  
- Not smoking**
  - Smoking heightens the risk of vascular disorders that can cause stroke and constrict arteries that deliver oxygen to the brain.

## Nutrition and Memory improvement

You probably know already that a diet based on fruits, vegetables, whole grains, and “healthy” fats will provide lots of health benefits, but such a diet can also improve memory. Research indicates that certain nutrients nurture and stimulate brain function.

**B vitamins, especially B6, B12, and folic acid**, protects neurons by breaking down homocysteine, an amino acid that is toxic to nerve cells. They’re also involved in making red blood cells, which carry oxygen. (Best sources: spinach and other dark leafy greens, broccoli, asparagus, strawberries, melons, black beans and other legumes, citrus fruits, soybeans.)

**Antioxidants like vitamins C and E, and beta carotene**, fight free radicals, which are atoms formed when oxygen interacts with certain molecules. Free radicals are highly reactive and can damage cells, but antioxidants can interact with them safely and neutralize them. Antioxidants also improve the flow of oxygen through the body and brain. (Best sources: blueberries and other berries, sweet potatoes, red tomatoes, spinach, broccoli, green tea, nuts and seeds, citrus fruits, liver.)

**Omega-3 fatty acids** are concentrated in the brain and are associated with cognitive function. They count as “healthy” fats, as opposed to saturated fats and trans fats, protecting against inflammation and high cholesterol. (Best sources: cold-water fish such as sardines and salmon; walnuts and walnut oil; flaxseed and flaxseed oil). Be aware of mercury in fish. Mercury-free Omega-3 supplements may be better. Nutrients work best when they’re consumed in foods, so try your best to eat a broad spectrum of colorful plant foods and

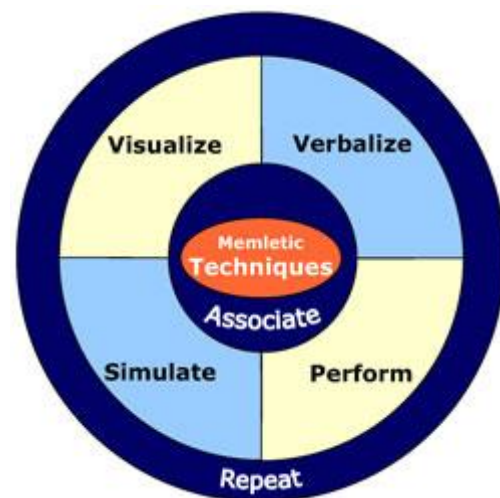
choose fats that will help clear, not clog, your arteries, e.g. cold pressed olive oil, avocado.

## Use Mnemonics and Memory Techniques

**In this section of the site you will see over thirty techniques dedicated to memorizing information and skills. These techniques will change the way you learn and remember. Some give you immediate results. Others take time to master but also deliver bigger benefits. Either way, you can be confident the time you spend with these techniques will improve your memory and help you learn faster.**

While there are many techniques spread throughout all parts of Memletics, this part focuses on techniques you use to memorize information and skills. You use these techniques mainly during the reinforce step of the Memletic Process.

These techniques reduce the overall amount of time you spend on learning and memorizing material. By using them, you reduce your dependence on “rote learning”—simply reading material over and over until it (hopefully) sinks in. The techniques may take some effort to learn, however they pay dividends later. They help by reducing your overall study time and improving how well you remember what have learned.



Some of the techniques I describe have been around since ancient Greek times. Many I've adapted from recently written references. A few are the result of my own work and I'm publishing them here for the first time.

To make it easier to understand and remember these techniques, I've grouped them into six categories. These are:

- **Associate.** Use basic characteristics of memory to learn new material.
- **Visualize.** Use mental imagery to support goals, rehearse skills and reinforce other techniques.
- **Verbalize.** Use words and writing to learn faster.
- **Simulate.** Simulate real-life performances using basic or advanced tools.
- **Perform.** Use specific techniques to learn skills and behaviors.
- **Repeat.** Use repetition techniques to help you lock in what you've learned.

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<b>Associate</b>	<ul style="list-style-type: none"><li>• General association</li><li>• First letter mnemonics</li><li>• Acrostic mnemonics</li><li>• Linked lists</li><li>• Peg words</li></ul>	<ul style="list-style-type: none"><li>• Peg events</li><li>• Mental journey or story</li><li>• Roman Rooms</li><li>• Chunking</li></ul>
<b>Visualize</b>	<ul style="list-style-type: none"><li>• General visualization</li><li>• Creative visualization</li></ul>	<ul style="list-style-type: none"><li>• Mental rehearsal</li><li>• Strengthening techniques</li></ul>
<b>Verbalize</b>	<ul style="list-style-type: none"><li>• General verbalization</li><li>• Assertions</li></ul>	<ul style="list-style-type: none"><li>• Mental firewall</li><li>• Scripting</li></ul>
<b>Simulate</b>	<ul style="list-style-type: none"><li>• Basic simulation</li><li>• PC simulation</li></ul>	<ul style="list-style-type: none"><li>• Advanced simulation</li><li>• Role-playing</li></ul>
<b>Perform</b>	<ul style="list-style-type: none"><li>• Three stage skill learning</li><li>• Part task training</li><li>• Performance variation</li><li>• Overlearning</li></ul>	<ul style="list-style-type: none"><li>• Shunt</li><li>• Anchoring</li></ul>
<b>Repeat</b>	<ul style="list-style-type: none"><li>• Rote learning</li><li>• Flashcards</li></ul>	<ul style="list-style-type: none"><li>• Scheduled review</li><li>• Programmed Repetition</li></ul>

### **Associate—link with what you already know**

Before we start, here is a simple exercise. Imagine for a moment a green cat, the size of a car, rollerblading over the Golden Gate Bridge. Seriously. Stop reading, close your eyes, and see that image in your mind's eye. Do this for thirty seconds. We'll come back to this exercise in a moment.

Memory is a network of neurons. The brain learns by associating new information with existing information. It adds new networks to existing networks of neurons. We can use this knowledge to our advantage via “association” techniques.

Association helps you quickly memorize a wide range of information, including lists, checklists, procedures, facts, formulas, numerical data and more. While it may sometimes take some effort to create the association, the benefit is longer retention. Many of the heavily marketed, and expensive, memory systems use association. If you are considering buying one of these courses, check to see they are not just the same techniques in different packaging.

In the previous section, we have discussed memory processes and introduced you to some basic concepts of memory. What we have presented, however, is just the tip of the iceberg. If you review research on memory and learning, you will find that there is a vast amount of information on the subject. But in learning to become more personally and academically effective, you are probably most interested in seeing how this knowledge can be put into practice. In other words, how can it help you improve your memory? Thus, we focus on memory techniques and strategies.

**1. PULLING IT ALL TOGETHER.** Organizing and ordering information can significantly improve memory. Imagine, for example, how difficult it would be to remember a random list of 62 letters. On the other hand, it would not be difficult to memorize the first sentence in this paragraph (consisting of 62 letters). Similarly, learning a large amount of unconnected and unorganized information from various classes can be very challenging. By organizing and adding meaning to the material prior to learning it, you can facilitate both storage and retrieval. In other words, you can learn it better and recall it easier. The following concepts can help you pull various pieces of information together in order to increase understanding and organization. This can mean organizing material on paper, such as when you make an outline or idea web, or simply organizing material in your memory, such as learning it in a particular order or making intentional associations between ideas.

**2. THE FUNNEL APPROACH.** This means learning general concepts before moving on to specific details. When you study in this manner, you focus on getting a general framework, or overview, before filling in the details. When you understand the general concepts first, the details make more sense. Rather than disconnected bits of information to memorize, such as history dates, the material fits together within the overall framework. Seeing how the smaller details relate to one another, you process the information more deeply (which helps you store, and later retrieve, it from memory). This idea is probably familiar--there are many learning strategies based on the funnel approach. For example, the approach is used in previewing a chapter for the major ideas as a way to enhance your comprehension of details contained in the chapter. You may also notice that many textbook chapters are organized in a "general to specific" format. Finally, you probably use this type of approach when studying from an outline, matrix, or concept map. Because of their organization, these tools are particularly well-suited for learning general to specific.

**3. ORGANIZING THROUGH MEANING AND ASSOCIATION.** Earlier, we discussed the concept of making intentional associations in order to improve learning retention. What do we mean by "intentional associations"? When learning, a person continually makes associations. We make associations between what we are learning and the environment we are in, between the information and our mental states, and between the information and our stream of thoughts. When things are associated in memory, thinking of one helps bring the other to mind. Have you ever actually retraced your path when you have forgotten where you put an object such as your keys? Often, as you approach the place where you put them, you are suddenly able to remember

the act of laying them down on the table or putting them in your gym bag. This is association. The memory of putting the keys down was associated with your memory of things in the environment. You can make associations work for you by making them intentional. When you are having difficulty recalling new material, you can help bring it to mind by thinking about what you have associated it with. In other words--retrace your mental path. We will return to this idea later when we discuss specific strategies.

a) **Deep processing--relating the material to yourself.** One way to process information more deeply, and also to create meaningful associations, is to think about how the information can be personally meaningful. You might think about how the new material relates to your life, your experience, or your goals. If you can link new information to memories already stored ("mental hooks"), you'll have more cues to recall the new material.

b) **Grouping.** This idea is probably best explained with an example. Before reading ahead, take a moment to complete the following exercise.

#### **EXERCISE: GROUPING**

Read the following list of sports one time. When you are done, write down as many of the sports as you can without looking back at the list.

Snow Skiing Basketball Tennis

Long Jump Bobsledding 100-Meter Dash

Hockey Baseball Ice Skate

Discus Golf High Jump

Volleyball Javelin Soccer

Luge Curling Cricket

Decathlon Hurdles

Note the number of sports you remembered correctly. We will return to this exercise later.

You can organize material by grouping similar concepts, or related ideas, together. Arranging the material into related groups helps your memory by organizing the information. For example, in the exercise you just completed, you could have grouped all of the sports into one of the following categories: a) Winter sports, b) Track and Field sports, and c) Sports using a ball. Keeping these categories in mind, try the exercise again. If you are like most people, you will be able to remember more of the sports.

Of course, in this instance, we created a list with the intention of demonstrating grouping; thus, there were 6 or 7 sports in each category. Still, with a little thought, this strategy can be used in a variety of ways. For example, can you think of other ways that these sports could be grouped? There are individual sports, team sports, sports you may enjoy, and sports you may dislike. There are sports requiring a great deal of equipment, and sports requiring little or none. When you are trying to remember lists for a test, the concepts and words may or may not have a natural organization. Therefore, you may need to be creative when making associations. Finally, the process of organizing a list into groups can often help you to understand the relationship between the concepts better.

**4. VIVID ASSOCIATIONS.** We have already discussed the idea of associations: aiding storage and retrieval of new information by intentionally pairing it with something familiar. When learning something new and unfamiliar, try pairing it with something you know very well, such as images, puns, music, whatever. The association does not have to make logical sense. Often times it is associations that are particularly vivid humorous, or silly that stay in your mind. Some people remember names this way. For example, they may remember the name "Robert Green" by picturing Robert playing golf (on the green), wearing green clothes, or covered in green paint. Or suppose for your anatomy course you have to recall names of the veins in the human body, and the first one on the list is "pancreatic" followed by "right gastroepipeloic" and "left gastroepipeloic" and so on. You can picture a frying pan being creative--maybe painting a picture with bright paints and bold strokes. If the frying pan is working in a studio, picture gas pipes with little padlocks on them (gastroepipeloic) in the left and right studio corners....

#### **VIVID ASSOCIATIONS: LEARNING THE NAMES OF CLASSMATES**

1. Pick names of classmates with whom you are unfamiliar.
2. For each name, brainstorm some words or ideas that you can associate with the name. For example, if one student's name is Teresa Martinez, you might think of Mother Teresa, a Martin (a type of bird), Mars the planet, a Martini (the drink), the word "terrific," Martinique, etc.
3. Once you have brainstormed several ideas, you can begin to think of ways that some of the associations can be combined to remember the name. In the above example, you could create a visual association by picturing Mother Teresa standing on the beach at Martinique.
4. Do this for each person, and you will have a great way to remember the names of your new classmates!

**5. ACTIVE LEARNING.** You will notice that the term "active learning" has come up frequently. Active learning facilitates your memory by helping you attend to and process information. All of the memory techniques we have discussed require active learning. Even if you attend every lecture and read



every assignment, there is no guarantee that you will learn and remember the information. Although you may passively absorb some material, to ensure that you remember important information requires being active and involved, that is attending to and thinking about what you are learning.

**6. VISUAL MEMORY.** Some people remember information best when it is encoded visually; if that is the case for you, then code information in this manner. But even if you do not consider yourself specifically "a visual learner," you may find that including visual memory can still help. After all, it is one more way of encoding and storing information--and one more way of retrieving it for a test.

There are many ways of visually encoding and retrieving information. We have already mentioned the strategy of associating concepts with visual images. But other aids to visual memory include diagrams, tables, outlines, etc. Often these are provided in texts, so take advantage of pictures, cartoons, charts, graphs, or any other visual material. You can also draw many of these things yourself. For example, try to visualize how the ideas relate to each other and draw a graph, chart, picture, or some other representation of the material. You may even want to make it a habit to convert difficult material into actual pictures or diagrams in your notes, or to convert words into mental images on the blackboard of your mind.

Finally, using your visual memory can be as simple as writing out vocabulary words, theories, or algebraic formulas. This allows you to not only practice (repeat) the information but also to see the way it looks on the page (developing a visual memory that you may be able to retrieve later). Another advantage is that it helps you take an active role in learning the material. When you draw your ideas on paper or write down things you are trying to remember, you have the opportunity to think about the information more deeply.

**7. TALK IT OUT.** When trying to memorize something, it can help to actually recite the information aloud. You might repeat ideas verbatim (when you need to do rote memorization), or you can repeat ideas in your own words (and thus ensure that you have a true understanding of the information). Repeating information aloud can help you encode the information (auditory encoding) and identify how well you have learned it. Some students have told us that they know the test information and are surprised when they "freeze" and cannot give adequate responses. For some students, this "freezing" may be a result of test anxiety. For others, however, it may be a result of overestimating how well they know the material. If you recite the information aloud from memory (answering questions, defining words, or using flash cards), it is often quite clear how well you know it. If you stumble in your responses, have to look up answers, or can only give a vague response, then you know that you need to study more.

Although reciting aloud can be a helpful memory technique, some people avoid it out of fear of appearing foolish ("what if someone sees me talking to myself?"). If this applies to you, work with a friend or study group. Another

advantage of working with someone else is that they can inform you when you are missing important concepts or misunderstanding an idea. Keep in mind, however, that studying with others does not work for everyone. For example, some students may become anxious or intimidated in study groups and would be more comfortable studying alone.

**8. VISUALIZE YOURSELF TEACHING THE MATERIAL.** An effective way to enhance recall and understanding of dense material is to teach it to an imaginary audience. By doing so, you are forced to organize the material in a way that makes sense to you and to anticipate potential questions that may be asked by your students. Moreover, by articulating your lecture aloud, you will uncover gaps in your comprehension (and recall) of the material. (Far better to discover those "weak" areas before a test than during it.) After you have mastered a particular section from your textbook, try delivering an organized lecture on any topic from that section. Then check for accuracy. Don't forget to anticipate questions that students might ask about the material as a way of anticipating potential test questions.

### **Mnemonic Techniques and Specific Memory Tricks to improve memory, memorization**

Mnemonic techniques are more specific memory aids. Many are based on the general memory strategies that were presented earlier. Although it can be easiest to remember those things that you understand well, sometimes you must rely on rote memory. The following techniques can be used to facilitate such memorization.

**1. ACRONYMS.** You form acronyms by using each first letter from a group of words to form a new word. This is particularly useful when remembering words in a specified order. Acronyms are very common in ordinary language and in many fields. Some examples of common acronyms include NBA (National Basketball Associations), SCUBA (Self Contained Underwater Breathing Apparatus), BTUs (British Thermal Units), and LASER (Light Amplification by Stimulated Emission of Radiation). What other common acronyms can you think of? The memory techniques in this section, for example, can be rearranged to form the acronym "SCRAM" (Sentences/acrostics, Chunking, Rhymes & songs, Acronyms, and Method of loci).

Let us suppose that you have to memorize the names of four kinds of fossils for your geology class: 1) actual remains, 2) Petrified, 3) Imprint, and 4) Molds or casts. Take the first letter of each item you are trying to remember: APIM. Then, arrange the letters so that the acronym resembles a word you are familiar with: PAIM or IMAP.

Although acronyms can be very useful memory aids, they do have some disadvantages. First, they are useful for rote memory, but do not aid comprehension. Be sure to differentiate between comprehension and

memory, keeping in mind that understanding is often the best way to remember. Some people assume that if they can remember something, that they must "know" it; but memorization does not necessarily imply understanding. A second problem with acronyms is that they can be difficult to form; not all lists of words will lend themselves equally well to this technique. Finally, acronyms, like everything else, can be forgotten if not committed to memory.

**2. SENTENCES/ACROSTICS.** Like acronyms, you use the first letter of each word you are trying to remember. Instead of making a new word, though, you use the letters to make a sentence. Here are some examples:

- My Dear Aunt Sally (mathematical order of operations: Multiply and Divide before you Add and Subtract)
- Kings Phil Came Over for the Genes Special (Kingdom, Phylum, Class, Order, Genus, Species)

Can you think of other examples? Like acronyms, acrostics can be very simple to remember and are particularly helpful when you need to remember a list in a specific order. One advantage over acronyms is that they are less limiting. If your words don't form easy-to-remember acronyms, using acrostics may be preferable. On the other hand, they can take more thought to create and require remembering a whole new sentence rather than just one word (as is the case with acronyms). Otherwise, they present the same problem as acronyms in that they aid memorization but not comprehension.

#### **EXERCISE: PRACTICE USING ACROSTICS**

1. Try making up a sentence (acrostic) to remember the five mnemonic techniques discussed in this section.
2. Now come up with acrostics for several of the main sections of a chapter from one of your textbooks.

**3. RHYMES & SONGS.** Rhythm, repetition, melody, and rhyme can all aid memory. Are you familiar with Homer's *Odyssey*? If you are familiar with the book, then you know that it is quite long. That is why it is so remarkable to realize that this, along with many ancient Greek stories, was told by storytellers who would rely solely on their memories. The use of rhyme, rhythm, and repetition helped the storytellers remember them.

You can use the same techniques to better remember information from courses. For example, even the simple addition of familiar rhythm and melody can help. Do you remember learning the alphabet? Many children learn the letters of the alphabet to the tune of "Twinkle, Twinkle, Little Star." In fact, a student demonstrated how she memorized the quadratic formula (notorious among algebra students for being long and difficult to remember) by singing it to a familiar tune!

Using these techniques can be fun, particularly for people who like to create. Rhymes and songs draw on your auditory memory and may be particularly useful for those who can learn tunes, songs, or poems easily. Like the other techniques in this section, however, they emphasize rote memory, not understanding. Also, when devising rhymes and songs, don't spend too much time creating them. Use these techniques judiciously and don't let them interfere with your studying.

**4. METHOD OF LOCI.** This technique was used by ancient orators to remember speeches, and it combines the use of organization, visual memory, and association. Before using the technique, you must identify a common path that you walk. This can be the walk from your dorm to class, a walk around your house, whatever is familiar. What is essential is that you have a vivid visual memory of the path and objects along it. Once you have determined your path, imagine yourself walking along it, and identify specific landmarks that you will pass. For example, the first landmark on your walk to campus could be your dorm room, next may be the front of the residence hall, next a familiar statue you pass, etc. The number of landmarks you choose will depend on the number of things you want to remember.

Once you have determined your path and visualized the landmarks, you are ready to use the path to remember your material. This is done by mentally associating each piece of information that you need to remember with one of these landmarks. For example, if you are trying to remember a list of mnemonics, you might remember the first--acronyms--by picturing SCUBA gear in your dorm room (SCUBA is an acronym).

You do not have to limit this to a path. You can use the same type of technique with just about any visual image that you can divide into specific sections. The most important thing is that you use something with which you are very familiar.

#### **EXERCISE: METHOD OF LOCI**

1. If someone reads a list of unrelated words to you, just once, how many do you think you could remember? Give it a try. Have someone read a list of 10 words to you at a slow but steady pace (about 1 word per second). Rather than using any of the memory techniques presented here, simply try to concentrate on the words and remember them. How many words did you remember?

2. Now take a few minutes to identify a path or object that you can use in the method of loci. Familiarize yourself with each of sections of your path or object. Mentally go through each of the loci (locations) and visualize them as best you can. Remember, it is important to be able to visualize and recall each location readily. Once you have done this, have your friend read you a different list of words. This time, try to create visual images of the words associated with one of the locations. This may not come easy at first, but with practice you should be able to create these visual images more readily. If you

find that you are having difficulty coming up with the images quickly, practice on some more lists until you have improved. Chances are, when you become familiar with using this technique, you will be able to remember many more words (maybe all 10 items).

3. Practice the technique to sharpen your skills.

5. **CHUNKING.** This is a technique generally used when remembering numbers, although the idea can be used for remembering other things as well. It is based on the idea that short-term memory is limited in the number of things that can be contained. A common rule is that a person can remember 7 (plus or minus 2) "items" in short-term memory. In other words, people can remember between 5 and 9 things at one time. You may notice that local telephone numbers have 7 digits. This is convenient because it is the average amount of numbers that a person can keep in his or her mind at one time.

When you use "chunking" to remember, you decrease the number of items you are holding in memory by increasing the size of each item. In remembering the number string 64831996, you could try to remember each number individually, or you could try thinking about the string as 64 83 19 96 (creating "chunks" of numbers). This breaks the group into a smaller number of "chunks." Instead of remembering 8 individual numbers, you are remembering four larger numbers. This is particularly helpful when you form "chunks" that are meaningful or familiar to you (in this case, the last four numbers in the series are "1996," which can easily be remembered as one chunk of information).

6. **PRACTICE MAKES PERFECT** (or closer to it anyway): Okay, it may not be a mnemonic, but repeating is still a great memory aid. Remember the children's game "I'm going on a picnic and I'm bringing..." As each new object is added, the old objects are repeated. People can often remember a large number of objects this way. When remembering a list of things, you might try a similar concept. Once you are able to remember 5 items on your list without looking, add a 6th, repeat the whole list from the start, add a 7th, and so on. It can be quite intimidating to see long lists, passages, or equations that you are expected to commit to memory. Break up the information into small bits that you can learn, one step at a time, and you may be surprised at how easy it can be. You might even utilize grouping techniques, like those discussed earlier, to form meaningful groups that you can learn one at a time.