

Study Skills/Learning Tactics

Seven study skills/learning tactics to apply to learning opportunities

Surveying techniques: Surveying is a skill that can be applied to a wide range of learning opportunities. Surveying a block of subject material (an instructor's handout, a section of a course syllabus, a chapter in a textbook, a patient's chart) is carried out by skimming the material to be studied. Read major topics and subheadings and the first sentence of paragraphs. Look quickly at charts and diagrams and read the captions. Textbooks usually have a summary at the end of each chapter that will provide an overview. Surveying carries out the following important functions:

1. Overcomes student inertia. Surveying is an excellent way to start a study.
2. Provides advance organizers. Advance organizers serve as topics or categories around which facts and details may be organized and subsequently learned. Advance organizers have been shown to be very important in helping students learn, remember, and interrelate material they have studied.
3. Builds a foundation: A preview of the material to be studied and learned forms a broad framework of prior knowledge upon which new knowledge and understanding can be built.

Learning objectives: It is important to determine what it is you want to or need to learn. Not everything is of equal importance. Objectives help focus on the more important information. In most cases objectives are provided by teachers. Some textbooks contain learning objectives. Other times learning objectives may not be explicit, and you will need to determine what is important to learn. Some suggestions on how this might be done are:

1. Pay close attention to the instructor's lectures, handouts, and other learning material supplied by the instructor. Frequently instructors structure their lectures and handout materials much like a textbook with heading and subheadings that will tell you what is important.
2. After you identify a topic or concept that is important, ask a series of questions about the topic or concept, that, when fully answered, will provide essential information necessary to understand the topic or concept.

Organizational techniques: Information can be organized in many different ways. Understanding the pattern of organization of information is an important guide to learning the information. Common patterns of organization are given below. As you go through the list think of ways that you might organize for study subject material organized for presentation by each of the common patterns on the list.

Sequencing: Information may be sequenced by:

- events in time; example = events in a normal menstrual cycle.

- stages leading to an end point; example = stages of a disease.
- position in space or location; example = structures arranged in sequence from the dorsal surface to the ventral surface of the chest cavity.
- importance; example = from most to least important symptoms of a disease process.

Listing: A common pattern of organization when items of information are all related to a common topic (like sequencing).

Definition: Provides meaning and identity to general classifications and gives distinguishing characteristics.

Classification: Organizes according to categories or characteristics.

Cause and Effect: Organization pattern present when events are causally related. An example would be the events that occur after inoculation with a vaccine.

Compare and contrast: Organizes by comparing similarities and/or contrasting differences.

Concept mapping technique: Humans learn new information best by integrating the new information into an existing knowledge base. This is called meaningful learning as contrasted to rote learning. Rote learning doesn't hang around the brain very long. Concept mapping utilizes this knowledge about learning by providing a technique by which interrelationships can be mapped or charted. It taps into a learner's cognitive structure and externalizes what the learner already knows while depicting relevant concepts and relationships the learner is currently learning. A meaningful map will integrate the new knowledge with the previous knowledge. References at the end of this section will steer you to the methods used to make a concept map.

Highlighting and attaching questions: Many students use highlighting or underlining techniques to emphasize information that they believe to be important. We have seen 900 page textbooks and complete syllabuses colored yellow or pink from cover to cover. In other words, highlighters have difficulty discerning degrees of importance in the text of a book, lecture notes, handouts or a syllabus. A process for increasing the efficacy of highlighting as a study skill/learning tactic is to attach questions to the highlighted text material. When a passage of text is highlighted, ask what question does the highlighted text answer, and write that question in the margin of your notes or textbook. Connect the question to the highlighted text and double check the question-answer relationship. What, why, when, where, which, how, and who questions tend to interrelate information and make a handy hook on which to hang information. The technique is a memory directed tactic, and is particularly useful in preparing for multiple choice examinations.

Acronyms: On Old Olympus Towering Tops A Finn And German Viewed Some Hops, or some variation of this acronym for remembering the twelve cranial nerves in order from cranial nerve I through cranial nerve XII has been around for a very long time. Study skill/learning tactics similar to acronyms are called "memory-directed tactics".

Imaging techniques: Imaging skills are perhaps one of the more important skills/learning tactics that you can develop in medical school. Imaging skills will involve the right hemisphere in the learning process. The right hemisphere tends to process separate elements into a holistic view of the information being learned. If you depend only on words and language for learning information, you are neglecting one of the most powerful ways of learning. By learning to convert written and/or spoken language into images you enter into "whole brain learning". The skill is really the reverse of seeing something and then describing what you see in descriptive language. In imaging, the more senses you can employ, the more effective the image will be for remembering information. For example, my professor in Gross Anatomy would frequently bring in a sack of bones, especially if we were looking at the bones of the wrist or ankle, and ask us to reach into the sack with our eyes closed and pull out a bone. We were asked to identify the bone by touch, determine the proximal and distal ends and name the other bones that articulated with the one in hand. After awhile, I could generate a mental image of the bone that was generated by feeling the bone. It became no more difficult than reaching into a bag of coins and identifying a coin by the sense of touch while generating a mental image of the coin. Clinicians use the same skill when they palpate an abdomen. Many will shut their eyes and try to visualize what they are palpating with their fingers. This is an example of the first medical imaging machine.

Reinforcement techniques: These are study skills designed to facilitate learning and to store the learned material in long term memory banks. Frequent repetition is an example of a reinforcement technique. Other examples are using new information to solve problems or to answer questions, and the "see one, do one, teach one" technique used to teach clinical skills. In the basic sciences, where learning is evaluated by objective examinations, frequent repetition and using the information to solve problems or to answer questions are the most effective techniques. A sequence of reinforcement might look like this:

1. The evening before a class **survey** the subject material to be covered the next day. **Skim** the text or syllabus. Major topics, subheadings, and the first sentence of paragraphs might be read. Charts and graphs are quickly scanned and the captions are read. Major topics and concepts are quickly listed in the notebook used for lecture notes. **The skimming and major topics list should be done in 30 minutes.** The list will form "advance organizers" (see [study skills/learning tactics](#)) that will serve as categories or concepts around which other information can be learned and organized. **Also take about 15 minutes to look back over the work that you did after the preceding class session.**
2. **Attend** to the lecture next day by adding information as subtopics under the list of advance organizers. The structure of each of the major concepts will begin to form as you carry out this task. Do not try to write down every thing. Most faculty present a syllabus, handout, or reading assignment that will contain the details needed to understand the topic under discussion. **Take 3-4 minutes to read through your notes immediately after the lecture.**
3. That evening read your notes again and **either begin to work out the content of the instructor's learning objectives or write out three or four questions that you will answer during that evenings study period.** Again, move quickly, using the objectives or questions to guide your study. There are several techniques listed under (see [study skills/learning tactics](#)) that will assist you in organizing an efficient study period.
4. Return to step 1 the evening prior to the next scheduled class in each subject.

5. The weekend will play an important role in this reinforcement scheme. **Study time during the weekend might be used to go back over the weeks work, tie up loose ends, and to organize the weeks work so that it can be easily reviewed prior to an examination.**

Taking notes from Lectures: It is very helpful to "skim" the material to be covered before the lecture, and to provide a list of **advance organizers** so that you can relate what the lecturer says to what you already know. Active listening is an important skill that will help you get maximum learning gain from a lecture. To listen actively, listen for the signals the lecturer uses to stress important information. **There are seven common signals used by most lecturers to signal important information, these are:**

1. Introduction of a topic: For example "next, I am going to discuss..."
2. Words that stress importance: For example "It is important to know that ...", "You should remember that ...", "The next exam will cover ...".
3. Definitions: "The term adductor means ...", "Atrophy is a process that ...".
4. Identification of a list or series of steps: "The stages in the process of wound healing are ...", "Damage to the ulnar nerve will cause the following list of problems...".
5. Writing on the blackboard, speaking slowly and louder, body language.
6. Showing a graphic or drawing on the blackboard.
7. Summarizing or restating important points.

The second portion of taking notes concerns organization of the subject material in some sort of descending order of detail. The list of advance organizers that you prepared by previewing the subject matter to be covered in class could form the major headings in an outline, or the first step in the development of a "concept map". The outline would develop the subject material from more general to specific details. A concept map will interconnect the elements in the outline and demonstrate visually how they are related.

Group study or Peer teaching: One of the most powerful ways to learn is to teach other students about a subject. One of the most efficient ways of completing the work of the medical curriculum is to organize a committed group of three or four students that will study, teach, and learn together. For example, understanding the structure and function of a sensory pathway in the nervous system might be divided into four parts, namely the structural and functional aspects of the system in: 1.) the peripheral nervous system; 2.) the spinal cord; 3.) the brain stem; and 4) the thalamus and cerebral cortex. One member of a four student group would take one of the parts and teach the other members about that part. The teaching should be done without notes and should utilize diagrams and other visuals. After the four presentations, discussion should center on "putting the four parts together". **Preparation and presentation of subject material is a reinforcement exercise that increases the learning of the "student teacher". Group discussion afterwards moves the learning from rote memorization into a conceptual understanding of the subject.**