Remembering scientific terms

Understanding the formation of technical words

Many students enter science-based courses knowing they will have to learn and remember extensive lists of complex terminology. While each discipline will have terminology that is particular to it, there are some common principles that apply to scientific terminology generally.

The purpose of this pamphlet is to help you understand the origins of scientific terms and the way these terms are formulated.

Many of the words used in science have their origins in Greek and Latin words. If you know the meanings of the Greek and Latin roots of words, it makes them easier to remember and apply. Similarly, as scientific words are often made up of several components, knowing these, and in particular the ones that are commonly used in your discipline, will help you remember them or help you to work out their meaning. Finally, understanding how information is classified within your discipline will also assist you in remembering related terminology.

1. Scientific terms often use prefixes and suffixes to provide additional information to the stem component of a term or word.

Prefix – found at the beginning of the word. Its function is to elaborate, qualify or change the meaning of a word. It is often an adjective or a description and can contribute its particular meaning to a word. For example:

Prefix	Meaning	Example	Meaning
An-	*no, not, without*	***an****aerobic*	*without air*
Bi-	*two*	***bi****lateral*	*two sides*
Macro-	*large*	***macro****pod*	*large foot*
Brachy-	*slow*	***Brachy****cardia*	*slow heart beat*
Hemi-	*half*	***hemi****sphere*	*half a sphere*

Suffix – found at the end of a word. It cannot be used alone, but when added after a stem or root word it completes the word. Its function is to form or change the meaning of the stem. Suffixes will also denote the type of word, for example an adjective, noun or verb.

They may also indicate a value, quality, action or relation, for example, gender, size, number or type. For example:

Suffix	Meaning	Example	Meaning
-itis	inflammation	*dermat****itis***	*skin inflammation*
-logy	*study of*	*bio****logy***	*study of life*
-er	*agent / person*	*train****er***	*one who trains*
-oid	*form*	*cub****oid***	*cube shaped*
-ectomy	*cut*	*append****ectomy***	*removal of appendix*

Stem or root – The stem word usually has its own meaning and can stand alone, whereas prefixes and suffixes modify the stem word. The stem often indicates a place or thing. Most stem words are derived from Greek or Latin.

For example: *cardiac* is a stem word meaning pertaining to the heart. When the prefix *myo* is placed before it, as in *myocardium* the meaning can be read as *muscle of the heart*, or *heart muscle.*

As each discipline has its own terminology you must obtain or develop your own comprehensive list of suffixes, prefixes and stems used within your area. Use these in conjunction with the following principles when you are reading and studying content in your discipline.

If you learn the key prefixes, stem words and suffixes for your branch of science, you will be able to decode many of the technical terms you meet in your studies.

2. Common word structures for your discipline

In scientific terminology there are often common ways of forming words. While there are inconsistencies to general rules, knowing these common ways of structuring words can help you both learn and recall them.

For example, the following are typical word endings that indicate singular or plural.

Singular	Plural	Example(singular)	Example (plural)
a	***ae***	*one vertabr**a***	*two vertabr**ae***
on	***a***	*a protozo**on***	*many protozo**a***
is	***es***	*a diagnos**is***	*several diagnos**es***

3. Scientific classification

Many scientific disciplines use a system or systems of classification for their content. These systems or groups are often developed in a layered hierarchy and follow particular rules. Knowing the systems of grouping and the principles that they follow can help students understand and recall the terminology by getting a 'mental fix' on the word.

For example, biology uses the following groupings for describing organisms:

SYSTEM	***Example (Human)***
Kingdom	*Animalia*
Phylum	*Chordata*
Class	*Vertabrata*
Order	*Primates*
Family	*Hominideae*
Genus	*Homo*
Species	*Sapiens*

Similarly, medicine classifies information into functional body systems such as the *musculoskeletal*, *circulatory*, *respiratory*, *nervous* and *auditory* systems. There is usually key terminology associated with each system.

Knowing *how* your discipline classifies its knowledge helps you in recalling the information because it provides guides or reminders of what should be included.

4. Consolidate your learning
(Adapted from Morris, 2004).

1. Create your own vocabulary lists of words that you are not familiar with but need to know, and put some time and effort into learning them. (There are many specialised lists compiled by others, however, by compiling your own you identify the ones you specifically need to know).
2. Once you have mastered these words move them to a list of words that you know and work on new, unfamiliar words.
3. Develop learning strategies that work for you. Remember, the more senses you use in learning new words, the better chance you have of remembering them.

   For example: you may make flash cards for each word or create visual maps of words (including a range of information about the words). While this may be time consuming it encompasses both writing (tactile) and reading (visual) skills.

   Alternatively, you may categorise words, for example, by structure (focus on stem, two recognisable parts), or by origin, (Greek, Latin or French). Finally you may use games (such as crossword puzzles or quizzes) to learn your words. If you are a verbal learner talking with friends can further assist the learning.
4. Practice and use newly learnt words as this will give your memory a purpose for learning them and if you don't use them you will forget them. Use them when you think, speak, read and write about your academic work.

Try these activities:

1. From the words below make up **new** words to fit the meanings:

For example: Very big star – may be: *extragrandestella*

- Large fingered:
- Device for looking at small things:
- Plants living in high places:
- People who only eat fish:
- A pub with no beer:

2. Translate this description into everyday English.

   The animal in question is a chloro-chromic megasaurian. It is a quadruped with a hexadental lower jaw and pentadigitalis feet. It is microcephalic and melano-dorsal, yet leuko-ventral.

3. What is this?

   One of the smallest muscles in the human body has one of the longest names: the *levator labii superioris alaeque nasi* muscle.

   (Its name means in Latin: *the lifter of the upper lip and of the wing of the nose muscle.)*

Works Cited

Chabner, D-E. (1991). *Medical terminology: A short course*. Philadelphia. W.B. Saunders
Fleming, J.D. (1994). *Medical language, Associations and images*. NJ. Slack.
Graham, L.J. 2004 *Medical terminology workbook* Copyright L.J. Graham ljg@smarchat.net.au
Mind tools: *Memory improvement*. http://www.mindtools.com Retrieved 14/4/05
Morris, T. (2004). *Vocabulary enhancement strategies*. http://www.smsu.edu/studyskills/new/vocabulary.html. Retrieved: 14/4/05.