

Name: _____

One stumbling block for many science students is the number of new vocabulary words they encounter. Each field of science has its own body of terms, and there are many additional terms that are used in all the fields of science. However, few people are likely to run across these terms in their daily lives until they enter science classes in school. How do students master this new language? The same way they master any vocabulary— by looking to the roots!

1. Prefixes and suffixes

Prefixes and *suffixes* play an important role in word structure. Prefixes are word parts that begin a word, and suffixes are word parts that end a word. These parts, also called *roots*, often have special meanings due to their use in other languages.

Prefixes and suffixes of words (and entire words themselves) in the English language are derived from other languages. Some of these languages like French are used in the world culture today and some languages belong to cultures long past. Latin and Greek are the two most common languages from which we derive pieces and parts of our words.

The study of languages provides tremendous benefit to understanding the meanings of words. Other languages provide us with greater understanding of our own language since the roots of many of the words come from these languages. For example, English, French, Italian and Spanish all have Latin as a common ancestral language. Therefore, studying French, Italian, or Spanish increases the size of your vocabulary toolbox. Studying Latin (or Greek) is also a tremendous aid for mastery and comprehension of the English vocabulary.

2. Isolating word parts

When you encounter a new word and are unsure of its meaning, find and isolate the prefix and suffix of the word. It may help to write the word on a separate sheet of paper and circle or underline these parts. The remaining, uncircled parts of the word may also have a special meaning. Now, study each part of the word and work towards understanding its meaning.

Example: Consider the word *blueberry*. There are two pieces to this word—the prefix *blue* and the suffix *berry*. Each of these word parts has its own meaning which, when combined with the other word part, gives the whole word its own, unique meaning. *Blue* denotes a color with which you are familiar. A *berry* is a small fruit that birds (and humans!) like to eat. Put them together, and you understand that *blueberry* probably means a small fruit that is colored blue! From your past experiences, you realize that this is a pretty good description of blueberries. Science words can be broken apart and analyzed in the same way to get an understanding of their meanings.

Below are some words you may encounter in a science class. For each word, circle the prefix and put a box around the suffix:

thermometer

electrolyte

monatomic

volumetric

endothermic

spectroscope

prototype

convex

supersaturated

3. Defining scientific terms

The table below lists some prefixes and suffixes that are found in scientific vocabulary along with their respective meanings. Use this table to write a definition for the following terms.

Prefixes	Suffixes
<i>homo</i> – same, equal	<i>-escence</i> – to exist
<i>poly</i> – many	<i>-meter</i> – measure
<i>hydro</i> – water	<i>-ology</i> – the study of
<i>lumen</i> -- light	<i>-mer</i> – unit
<i>spectro</i> – a continuous range or full extent	<i>-geneous</i> – kind or type
<i>hetero</i> – different	

1. *hydrology* – _____
2. *polymer* – _____
3. *homogeneous* – _____
4. *heterogeneous* – _____
5. *luminescence* – _____
6. *spectrometer* – _____

Now, using a dictionary, look up the words for which you provided your own definition, and write the formal definitions in the spaces below:

1. *hydrology* – _____
2. *polymer* – _____
3. *homogeneous* – _____
4. *heterogeneous* – _____
5. *luminescence* – _____
6. *spectrometer* – _____

4. Using roots to create words

Using the table of prefixes and suffixes provided on the following page, write a word that corresponds to each of the following definitions:

Prefixes	Suffixes
<i>thermo</i> – heat	<i>-scope</i> – to view
<i>mono</i> – one	<i>-meter</i> – measure
<i>tele</i> – far	<i>-atomic</i> – indivisible unit
<i>sono</i> – sound, tone	<i>-graph, -gram</i> – something written

1. A device to measure heat or temperature – _____
2. A graph showing the loudness and frequencies of sounds – _____
3. Having only one type of “indivisible” unit – _____
4. A device used to view distant objects – _____

Look up the words you created in the dictionary. Write your words and the accepted definitions in the space below:

Word	Dictionary Definition

How closely did your definitions match the accepted ones found in the dictionary? Your definitions based on your understanding of the roots for the prefixes and suffixes likely provided you with good results. A thorough knowledge of prefixes and suffixes will be a tremendous help to you as you proceed through your science education and will enable you to better understand the written and spoken language you encounter in your daily life.

5. Example: Figuring out a word

It is now time to use word parts to help figure out the definition of a word. Consider the word *phrenopathia*. Most people are unfamiliar with this term. If you ran across this term in your reading, you would have to:

1. Use a dictionary.
2. Study the word by breaking it into parts.

Using a dictionary is always a good way to find the meaning of words. There are usually dictionaries available in the classroom (including science dictionaries), and there are thorough online dictionaries to use if you come across terms while researching information on the Internet.

However, if one is not available, you will have to study the word yourself to make meaning of the term. Let's assume you do not have a dictionary available and have to puzzle out the meaning of this word by yourself. First, break the word into its component parts, the prefix and suffix.

Prefix: phreno

Suffix: pathia

Next, you need to find or know the roots or special meanings associated with these word parts. Here's where a study of languages provides tremendous benefit.

Both the prefix and suffix of our word—*phrenopathia*—are derived from Greek. *Phren* stems from the Greek word *phrenos*, meaning *mind*. The suffix *pathia* stems from the Greek word *pathos*, which means *suffering*. You would conclude, then, that *phrenopathia* has something to do with the “suffering of the mind,” and you would be correct.

From Webster's Dictionary: Phrenopathia - Any mental disease or disorder.

Once you have mastered the meaning of word roots, you can extend this knowledge to any words containing those roots. For example, from your knowledge of the roots for *phrenopathia*, you could begin to identify the definitions of words such as:

- phrenologist – a person who studies mental disorders
- phrenitis – an inflammation of the brain
- phrenism – a mental activity or intellectual power
- neuropathy – disease of the nervous system
- sociopathy – a disease characterized by violent antisocial behaviors

Roots of words can be found in dictionaries, in special books that are dedicated to listing roots and their meanings, and from many online sources. The more familiarity you have with word roots, the larger your toolbox for working through science (and nonscience) vocabulary.