Biology is the study of living organisms and to understand anatomy and physiology, a nurse must first grasp the science of biology. While you may not use your knowledge of biology directly every day, biology serves as a prerequisite before moving on to other sciences such as anatomy, physiology, and microbiology.

Here are some key concepts you should understand in order to do well on the Biology section of the HESI test:

Classification of Organisms

Early biologists faced difficulty in devising a method for discerning living organisms from nonliving things. After developing rules to differentiate life from non-life, scientists then faced the struggle of organizing and classifying life. Taxonomy, or the science of classifying, resulted from these early struggles. Many years of classification have occurred since, and because of advancements in biotechnology, scientists can now categorize life based on similarities and differences at the genetic level. Scientists utilize a hierarchical system for classifying organisms. Six Kingdoms contain the taxonomic breakdown of life. These Kingdoms are further divided into Phyla, then Class, Order, Family, Genus, and Species. A common mnemonic for remembering this hierarchy is, “King Phillip Came Over For Great Spaghetti,” where the first letter of every word indicates the corresponding taxonomic class. Over the years, the taxonomic classification schemes have changed and will continue to change as we further our understanding of genetics. Currently, scientists use Six Kingdoms to subdivide life: Bacteria, Protozoa, Chromista, Plantae, Fungi, and Animalia make up these Six Kingdoms. Scientists categorize organisms within one of these Kingdoms by investigating the organisms’ cellular composition, methods for obtaining and using energy, genotypic similarities, and other techniques.

The Scientific Method

The Scientific Method is a way of devising and performing experiments that yield meaningful results. It involves a procedural approach to gaining information about the physical world that begins with a formulated question and ends with the rejection of a hypothesis and the reevaluation of the experiment.

The Scientific Method can be summarized as the following:

Question — A curiosity about a phenomenon arises and, in response, a question is formulated. Early thinkers looked at the sky and wondered why it was blue or looked at the grass and wondered why it was green.

Research — After formulating a question, a scientist looks for any relevant research or data already discovered and provided for the phenomenon in question. This helps give some direction in how to set up or approach the question.

Hypothesis — The scientist then generates a hypothesis, or an educated guess, as to what could be causing the phenomenon. This step helps narrow down the possible options for experimentation.

Experiment — Using available measuring tools and technology, an experiment is designed to provide valuable data for the scientist to investigate.

Evaluation — The data will then be analyzed and assessed for its validity. Do the observations made support the hypothesis, or do they support a different hypothesis?

Conclusion — Finally, the scientist will decide if the hypothesis is confirmed, in which case other scientists will then recreate the same experiment to confirm that the results hold true in a different time or place using the same methods. If the hypothesis is not confirmed, the scientist may choose to adjust some of the experimental methods or devise a new hypothesis.

Overall, the Scientific Method provides a methodical approach for investigating experiments, data, and drawn conclusions. It is worthwhile to know that developments in scientific research do not arise from haphazard guessing and checking, but rather through logical design and reasoning. Even a basic familiarity with the method will prove useful when making sense of scientific experiments.

Cells, Tissues, and Organs

The most fundamental unit of life is the cell. Organisms that exist as a single cell, like bacterium, are called prokaryotes and those that are multicellular, like humans, are called eukaryotes. The major difference between these two groups is that eukaryotes possess a nucleus and membrane bound organelles while prokaryotes do not.

Beginning with an understanding of the cell, its form and function, we can start to make sense of how life operates, and what cellular features enable this operation. Learning the components of the cell is not a difficult task, but it can be tedious.

One great way to learn about cells is to complement lists of cellular components/features with drawings of cells— this is particularly useful for eukaryotic cells and their organelles. Accompany these drawings with the name of the cell “part” and what its function or purpose is. For example, the

nucleus houses genetic information and instructions for cellular operations; the mitochondrion helps generate ATP to provide energy for the cell, etc. A mini white board can be a huge asset in learning the differences between plant, animal, and bacterial cells. Repeatedly diagramming the components of the various cell types and their parts (noting similarities and differences) will lead to long-term retention.

When a group of cells function together to accomplish tasks, they are operating as tissue. Due to the differences at the cellular level, plants and animals organize into different types of tissue. Plants possess meristematic tissues, which enable them to increase in size, and permanent tissues, which enable them to maintain their form.

Animals possess connective, epithelial, muscle, and nervous tissues. Like the tissues in plants, these groups serve different functions and have different forms. Connective tissues provide structure to organisms. Epithelial tissues are those found where cells line and cover organs. Muscle tissue allows animals to move, and nervous tissue enables animals to send and receive signals to its different parts.

Just as cells combine to form tissues, tissues combine to form organs. Humans possess an extensive list of organs that all serve a particular function: some help digest food to provide energy, while others help circulate air and blood. And, like tissues, organs act collaboratively to form organ systems.

The same methods of learning the cells and their functions can be applied to tissues, organs, and then organ systems. It is most important to generate your own diagrams when learning the form and function of these different systems. It is easy to believe that one has a solid grasp of these things when reading from a book or even a page of notes; however, this is much different from being able to work from the ground up in describing the composition of organisms. Condense lists of organismal features into its basic parts, and work through repeatedly processing this information with the aid of a whiteboard and note cards.

Genetics and Heredity

Heredity is the passing on of genetic traits from one generation to the next; it is the reason that children resemble parents, and why humans give birth to other humans. Genetics is the study of the principles underlying heredity.

A workable knowledge of genetics is impossible without becoming familiar with DNA (deoxyribonucleic acid). This familiarity entails its composition [knowing that guanine, cytosine, adenine, and thymine (also known as GCAT) are its nucleotides, knowing how they pair, and knowing that its strands run antiparallel, among other features], as well as its function (to house and maintain the instructions for a cell’s operations).

An understanding of “the central dogma” of molecular biology, which states that genetic information flows from DNA to RNA to proteins, can serve as a great outline for how gene transfer takes place. This understanding can help you be familiar with DNA replication before moving on to transcription and translation, the details of all of which can be processed through learning the names and functions of the various structures and enzymes involved. As this is a systematic procedure that incorporates many different parts, drawing and redrawing diagrams can prove worthwhile for long-term retention of the operations.

When these operations are understood, a more general understanding of the genetics can be studied. A familiarity with Gregor Mendel and his laws (Law of Dominance, Law of Segregation, and the Law of Independent Assortment) can act as a solid foundation for genetic transfer beyond the microscopic scale. This will lead one to learning about parents, first and second generations, and the expression of phenotypes as predicted with Punnett squares.

Much of the difficulty in learning about genetics and heredity stems from the necessity of learning an exhaustive number of terms and definitions. Intelligent usage of flash cards and diagrams can address these issues.

Mitosis and Meiosis

Mitosis and meiosis are processes by which cells reproduce. Mitosis is a form of asexual reproduction where the resulting cell is genetically identical to the parent cell, whereas meiosis results in a cell that contains only half of the chromosomes found in the parent cell. When reviewing the two processes, it is wise to note both the similarities and the differences. Similar to the method used for recalling the various taxonomic classes, a mnemonic device can prove valuable in learning the stages of mitosis and meiosis.

While these two reproduction methods share essentially the same steps, it can be useful to think that because meiosis is involved in sexual reproduction, a method for diversifying life; it is more complicated than mitosis. Recalling this can help you remember which mnemonic goes with which process.

A familiarity with the cell cycle is helpful in understanding these two processes. Cells do not arbitrarily reproduce, nor do they reproduce nonstop. Instead, there are triggers and signals that must be present before a cell will begin reproduction. Mitosis can be broken down into four major stages: prophase, metaphase, anaphase, and telophase. But there are two additional “stages” of interphase and cytokinesis. The acronym IPMATC can be useful in recalling the order in which these stages happen.

Meiosis shares the same stages, but it occurs in two ordered sequences, so there is an IPMAT 1 and an IPMAT 2. The best method for retaining the details involved in both processes is to utilize a

white board and diagrams, drawing and redrawing the steps until this can be done without the aid of any reference material. It may sound repetitive, but this method of learning is invaluable for gaining a functional knowledge of this material.

Photosynthesis

Photosynthesis is the process by which plants transform the energy in light into chemical energy that can be used to fuel life functions. A solid grasp of photosynthesis entails an understanding of what cellular structures enable the process (think chloroplasts, and other structures present in plant cells that are not in animal cells) as well as how the process happens (without carbon dioxide and water the process cannot take place).

Just as you should be familiar with the chemical equation governing cellular respiration (the energy liberating process in animal cells), you should also know the chemical equation relating the reactants and products of photosynthesis. Both of these processes rely upon the transfer of free electrons to generate chemical energy. And, just as animal cells carry out the Krebs cycle to generate ATP, plants carry out the Calvin cycle to generate energy. Analogs like this are very useful to recognize as they can reduce two distinct processes into a single concept and thus simplify the material to be learned.

A familiarity with the different types of photosynthesis is also useful to learn. Some types require the presence of light whereas others can be performed in the absence of light. An understanding of what biological purpose or function this serves can be helpful. Similarly to all of the other systems and processes, the usage of a white board and diagrams, as well as a complementary list of the cellular features necessary, can prove invaluable when reviewing involved procedures such as photosynthesis. However, when you can already generate the information without the aid of reference materials, you can be certain that you have developed a firm comprehension of the concept.

Chemistry

While chemistry may not seem relevant to nursing, it’s more applicable than you might think. Nurses must understand the use of the medication they are providing, the conversions, and they even need to understand how the medications work. Advancing your career into more specialized fields requires you to posses not only a basic understanding of chemistry, but perhaps organic chemistry, or physical chemistry as well. Having a solid foundation in chemistry is key to understanding how certain drugs interact, which directly affects patient outcomes. Here are some basic chemistry concepts you should understand in order to do well on the Chemistry section of the HESI:

Units of Measurement

Metric

Volumes are usually measured in milliliters (ml) or cubic centimeters (cm^2cm2).

1 ml = 0.001

1 Liter = 1 cm^2cm2

e.g. 5 L = 5000 ml = 5000 cm^2cm2

Masses are usually measured in grams (g) or kilograms (kg), where 1 kg = 1000 g.

The volume of 1 kg of water is approximately 1 L. So the volume of 1 g of water is roughly 1 L / 1000 = 1 ml or 1 cm^2cm2.

Lengths are commonly measured in meters (m), centimeters (cm), or millimeters (mm).

Imperial

Imperial units are less commonly used now, but you may need to convert from imperial to metric. Imperial units of volume are pints and gallons. Lengths can be given in inches, feet, yards, or miles and masses can be given in ounces, pounds, or stones.

1 gallon = 4.5 liters

1 liter = 1.75 pints

1 inch = 2.54 cm

1 foot = 30.5 cm

1 yard = 91.44 cm

1 km = 5/8 miles

1 kg = 2.2 pounds

1 pound = 16 ounces

1 stone = 14 pounds

States of Matter

There are four fundamental states of matter—solid, liquid, gas, and plasma. Solids are characterized by closely packed particles, held together by strong intermolecular forces to form a definite shape. Heating a solid to a temperature above its melting point transforms it into a liquid. In liquids, the intermolecular forces are weaker, meaning the particles have more freedom of movement. A liquid can be turned into a gas by heating it to a temperature higher than its boiling point. In a gas, the particles have enough kinetic energy to overcome the intermolecular forces and can move freely. Heating a gas to extremely high temperatures can produce plasma. This causes the electrons in an atom to separate from the nuclei and plasma can be thought of as a cloud of free electrons and positively charged ions.

Atoms

Elements are made of atoms, and atoms are made of three types of particles—negatively charged electrons, positively charged protons, and neutral neutrons.

The protons and neutrons make up the nucleus of the atom. The nucleus has a very small diameter compared to the overall size of the atom, but it is where most of the mass is concentrated. The electrons orbit the nucleus in shells and most of the volume of the atom is taken up by the free space between the nucleus and electrons.

An element's nuclear symbol tells you how many electrons, protons, and neutrons make up each atom.

AZXZAX

X is the element symbol.

A is the mass number, which tells you the total number of protons and neutrons in the nucleus.

Z is the atomic number, which is the number of protons in the nucleus.

For neutral atoms, the number of protons is equal to the number of electrons. The number of neutrons is *A*—*Z*.

For example, a neutral atom of lithium represented by the nuclear symbol 73Li37Li has three protons, three electrons, and four neutrons.
Ions have unequal numbers of protons and electrons. Positive ions have more protons than electrons and negative ions have more electrons than protons.

All atoms of the same element have the same number of protons. Isotopes are atoms of the same element but with different numbers of neutrons. For example, 126C612C and 136C613C are both isotopes of carbon.

Acids and Bases

The acidity or basicity of a chemical or solution can be measured using the pH scale. The pH scale ranges from 0 to 14 and a pH of 7 is neutral. A solution with a pH lower than 7 is classed as acidic and a solution with a pH higher than 7 is classed as basic.

Hydrochloric acid (HCl), which is found in the stomach, is a very strong acid with a pH of 1. Water is neutral, with a pH of 7. Sodium bicarbonate (NaHCO3NaHCO3) has a pH of 9, making it a weak alkali. Sodium hydroxide (NaOH) is a very strong alkali and when concentrated can have a pH of 14. The pH scale is logarithmic with a basis of 10. This means that each unit difference corresponds to a change of a factor of 10. For example, pH 3 is 10 times more acidic than pH 4 and 1000 times more acidic than pH 6.

Chemical Equations

Balanced equations should have the same number of each type of atom on both sides. To balance equations, you have to add or subtract compounds. Balance the equation:

$$C_2H_6+O_2 \rightarrow CO_2+2H_2O C2H6+O2 \rightarrow CO2+2H2O$$

The first step is to work out the number of atoms on each side:

Left	Right
C = 2	C = 1
H = 6	H = 4
O = 2	O = 3

The right side needs 1 more ion of C and 2 more ions of H, so we can add 1 more $CO_2 CO2$ compound and 1 more $H_2O H2O$ compound and the equation becomes:

$$C_2H_6+O_2 \rightarrow 2CO_2+3H_2O C2H6+O2 \rightarrow 2CO2+3H2O$$

Left	Right
C = 2	C = 2
H = 6	H = 6
O = 2	O = 7

Because we have also added more ions of O to the right, we now need five more ions of O on the left to make 7 ions in total. Add another 2.5 ions of O2 to the left and the equation is balanced:

$$C_2H_6+3.5O_2 \rightarrow 2CO_2+3H_2O C2H6+3.5O2 \rightarrow 2CO2+3H2O$$

Left	Right
C = 2	C = 2
H = 6	H = 6
O = 7	O = 7

Chemical Reactions

Particles in liquids and gases are constantly moving and colliding with each other. Under the right conditions, these particles can react. To start a reaction, the particles need to have a minimum amount of kinetic energy, known as the activation energy. This is the amount of energy required to break the bonds within each particle.

The rate of a reaction increases as temperature increases because the particles will have more kinetic energy. This means that they will be moving faster and colliding more often and be more likely to have enough energy to break the activation barrier. Increasing concentration also increases the rate of reaction because this will increase the number of particle collisions.

Catalysts can also be added to increase the reaction rate. These work by lowering the activation energy. In the following example, platinum is used as a catalyst in the reaction, which makes nitric acid from ammonia.

$$NH_3+O_2 \rightarrow HNO_3 NH3+O2 \rightarrow HNO3$$

Oxidation and Reduction Reactions

Oxidation is the loss of electrons. Reduction is a gain of electrons. In redox (oxidation and reduction) reactions, oxidation and reduction occurs simultaneously.

In the reaction:

$$Na+12Cl_2 \rightarrow Na+Cl-Na+12Cl2 \rightarrow Na+Cl-$$

sodium is oxidized because it loses an electron and chlorine is reduced because it gains an electron—sodium is the electron donor and chlorine is the electron acceptor.

Grammar

The Grammar section of the HESI test contains 50 questions and is timed for 50 minutes. The questions involve knowing some very basic rules of written English, such as the names and meanings of the various parts of speech, as well as how, and when, to use these words in a sentence. The Grammar section also deals with punctuation—what mark to use and when to use it. If you take a little time to go over the following things, it will be a lot easier on test day. Many online grammar practice sites are available for you to use, so you'll be even more comfortable with these types of questions. Just search for the following topics online.

Parts of Speech

Remember all the lessons about nouns and verbs? Well, those could come in really handy right about now! Be sure to familiarize yourself with the eight parts of speech: noun, verb, adverb,

adjective, preposition, conjunction, pronoun, and interjection. It may also be helpful to know what these mean: pronoun-antecedent, subject, and predicate.

For example, you know a *verb* is an action or being word. Well, a *predicate* is just the verb, plus the other words that go with the verb.

Look at this sentence:

Harry wrote the letter neatly.

Wrote is the verb and *wrote the letter neatly* is the predicate.

Verb Forms and Tenses

Besides knowing what part of speech verbs are, you must know what form and tense of a verb to use in different situations. For instance, do you use *ring*, *rang*, or *rung*, when talking about a bell? The rule for this is: ring is what a bell does in the present tense, rang is in the past, and rung is in the past perfect, and must use *has*, *had*, or *have*. Other words like this include *swim* and *bring* (there is no such word as *brang*). Some very common errors are also made with these words: see, saw, seen.

You can say, “I saw,” but not “I seen.” You have to use have or had with seen. The same goes for *ride*, *rode*, and *have/has/had ridden*. But never use have, had, or has with saw or rode. Yeah, isn’t the English language great?

Pronoun Use

Unless you are about 2 years old, you know that the sentence “Her went to the store” does not sound right. But what about this? Which one is correct?

Jamie called Butch and I to dinner.

Jamie called Butch and me to dinner.

Believe it or not, it’s the second one. The word *me* is used for objects and *I* is used for subjects in a sentence. An easier way to determine *me* versus *I* is to take the other person out of the sentence and see which sounds right. “Jamie called I to dinner” just doesn’t cut it. It would be “Jamie and I went to dinner” because “*Me* went to dinner” is just wrong.

Also, practice the use of him and her, as well as when to use himself or herself, instead. Oh, and there is also no such word as “theirselves.”

Capitalization

If you've read things on social media lately, you know that some people can go a little crazy with capital letters. Some people use them all the time and some, not at all. For this test, you'll need to prove you *know* the rules.

Basically, all sentences and proper nouns (the name of a person, place, or thing) begin with a capital letter. So do titles of people (Mr., Dr., etc.) and a few other word types. You can find a number of lists of capitalization rules online to help you nail this skill.

There are some tricky things to capitalization, too. For example, look at the word dad in these sentences. Both are correct.

My *dad* is my best friend.

I told *Dad* to come with us.

Why the difference? In the second sentence, *Dad* is used as a name. In the first, it is not. Saying, "my dad" is the same as saying, "my ball, my dog, my pencil," none of which need capital letters.

Punctuation

Punctuation basics are easy, right? A period at the end of a sentence, question mark after a question, etc. But there are some confusing points, too. Here are a few rules to remember:

- Commas used in a series of words typically include one before the word and in academic writing: I had apples, peaches, and pears for lunch. This is the serial comma, or also known as Oxford comma. It is a matter of style preference, so remember to check the preferred style guide of the institution, or school, for whom you are writing, or read test instructions, and practice consistency.)
- An apostrophe used to show possession is always directly after the person/s or animal/s that actually possess/es the thing: If the bone belongs to one dog, it is "the dog's bone," but if it belongs to two or more dogs, it is "the dogs' bone."
- Looking up other apostrophe rules would be good idea. There are many.
- Apostrophes are not used just to form a plural! "I love my baby's" is just not right. It should be babies.
- Quotation marks: Generally, all other forms of punctuation are written inside the quotes. Jean said, "I am the oldest person here." And "Hi!" said Tom.
- Review where to use a hyphen (-).

Confusing Words

The English language has many confusing words. The HESI Grammar section will test your knowledge of a few of them. To prepare for this section of the test, take note of the following reminders:

- Know the differences among *your/you're*, *there/their/they're*, and *its/it's*. You should be able to split any two words that are joined with an apostrophe into those two words and have the sentence still make sense.

Example: "I saw you're house" may sound right, but if you split *you're* into two words, it becomes "I saw *you are* house," which is not right. By the same token, "Your my best friend" is not right, either. This time, it *is* supposed to have the equivalent of *you are* in it, so "You're my best friend" works.

- Other tricky words to study include: *accept/except*, *effect/affect*, and *advice/advise*. Example: He gives *advice*. But, He did not*advise* her.
- Know when to use *lay* and *lie*, *less* and *fewer*, *harder* and *hardest*, etc. Trick: Use *-er* ending when comparing two things and *-est* for three or more.
- It should be "I could *have* danced all night," not "I could *of* danced all night."
- *Its* is the only possessive that doesn't have an apostrophe. *It's*, with the apostrophe, means *it is*.

Sentence Structure

Some of the questions will ask you to decide which form of a sentence is correct. What this means is, "Which form makes the meaning most clear to you, the reader?" This may involve punctuation or word usage. There may be two answers that are actually correct, but only one of them is best.

For example: Jane was just thinking of John, not Tim, when she ran into him. (It is not clear who she ran into.)

This is better: Jane had been thinking of John when she ran into Tim.

Other Items

It would probably be a good idea to know what each of the following items mean and to be able to tell if a sentence has them and where they are in the sentence:

- dependent clause
- independent clause
- weak clause

- active verb tense

Reading Comprehension

Most careers require a firm grasp of reading and writing. In nursing, having above average reading comprehension skills is paramount to your success. If you cannot read a chart, or worse yet, read a chart and immediately understand everything that is written, you could be endangering the lives of your patients. Nurses need to read and read at a high level in order to function in a professional manner.

The Reading Comprehension section of the HESI exam asks you to read a short scientific paragraph and answer multiple questions about its content. Here are some key concepts you should familiarize yourself with in order to do well on this portion of the exam:

Main Idea

The main idea of a paragraph is the essence of a paragraph. If you were to summarize a passage in a single sentence or idea, you would find that passage's main idea. To locate the main idea, read the entire passage and pay close attention to the last few sentences. Typically, the main idea is summarized at the close of the first paragraph, or at the close of a paragraph.

Supporting Details

Supporting details exist to support the main idea. In a paragraph format, these details come after the topic sentence—the first sentence in a paragraph, usually—and before the final sentence. Supporting details serve as pillars to "hold up" the main idea of a passage or paragraph, and could also be identified as proof or evidence of an idea.

Author's Purpose

Author's purpose can be difficult to figure out. It differs from a main idea, in that it is the driving force behind the main idea rather than the primary focus itself. An author's purpose may be found by asking the questions "why" and "how." Why is the author composing this piece? How is the author going about it? Discovering why the work is being written and how it is doing so will identify the purpose of the piece; for instance, you might find an author is writing a piece to inform his audience using persuasive language. This answers the why (to inform) and how (persuade). From there, you can determine that the author's purpose is to sway the audience to a certain way of thinking.

Tone of the Piece

The tone of a piece is the attitude with which the piece is treated. “Tone” encompasses a wide range of descriptors, ranging from broad (formal and informal) to incredibly detailed (condescending). Tone is extremely important in deciphering the why and how of a piece because it lends insight into the author’s frame of mind. A work taken at face value, for instance, might not recognize an author’s ironic tone and, consequently, may be misunderstood or misinterpreted. To determine tone, ask yourself how the piece is being treated. What kind of language is being used? Is it funny, serious, or dramatic? What is the topic of the piece? Each of these questions, working together, will reveal the tone of a work.

Drawing Conclusions and Making Inferences

Drawing conclusions and making inferences are two interwoven ways to come to an understanding of a piece. Drawing conclusions involves looking at the facts, interpreting their purpose and meaning, and coming to a realization using those facts. Making inferences is similar, but rather than coming to a conclusion, facts are used to determine other facts that will eventually lead to a conclusion.

To draw a conclusion, look at the presented facts (and inferences), and determine what the author is saying using these facts. To make an inference, look at the facts presented, and determine what other facts might be realized in conjunction with the existing ones. For instance, if evidence is presented that a leather shoe is damaged, and the owner of the shoes was near a lake, you can infer that the shoes were damaged by water.

Fact vs. Opinion

Fact is immutable, while opinion is entirely subjective. Facts are derived from tangible evidence (using sight, taste, touch, etc.) and are frequently regarded as universal truths. Opinions, however, are not presented with evidence, but are presented as feelings and interpretations from one individual or a group of individual.

When trying to determine whether something is a fact or an opinion, seek out supporting details. If something has numerous evidential supporting details, it is likely to be a fact. If something is supported largely with arguments or appeals to emotion, it is likely to be an opinion.

Compare and Contrast

Comparing and contrasting, while similar, are two very different actions. Comparing is the act of taking two or more things and working to identify similarities between those things. If you were to compare a cat and a dog, for instance, you might note that both are domesticated animals, both possess coats of fur, and both possess tails. Contrasting involves looking at two or more items and working to identify their differences. Again using a cat and a dog, you might note differences in temperaments, in size, and in the basic structure of ears. Comparing is finding similarities, while contrasting is identifying differences.

There are certain words that can help clue you in as to whether an author is trying to compare or contrast. Words such as “and,” “also,” and “too” indicate comparison, whereas words such as “but,” “however,” “although,” and “nevertheless” indicate difference.

Context Clues

Context clue is a term used to describe portions of a passage that lend insight into an idea or a word. Using context clues to find the meaning of a word involves looking at the sentences and phrases surrounding the word in question, and determining what meaning best fits the word based on what is being said in the passage. Using context clues to determine the meaning of an idea is similar; search the sentences and phrases surrounding the idea, and use those excerpts to determine the meaning or purpose of an idea.

Summarizing

Summaries usually come at the end of paragraphs and in the conclusion of pieces. A summary is used to concisely describe the overall purpose and message of a piece. The most common iteration of summaries can be found on the back of a film case; the movie is summarized to draw interest in the story and give an idea of what the story is about.

In literature and academia, the purpose of a summary is no different; summaries are short passages used to give an idea of a work’s content and draw the interest of the audience.

Vocabulary

Nurses with a greater range in their vocabulary have greater chances of communicating correctly than those that do not. In the operating room or on the floor, nurses must be able to communicate effectively and having a robust vocabulary is a key part of being able to do that.

The Vocabulary section of the HESI exam covers both medical vocabulary as well as vocabulary used in everyday language. Although it is impossible to memorize every word in the English language, mastering these key concepts is essential to doing well on this portion of the test.

Medical Terminology

Unlike many other jobs, a medical position requires a working knowledge of a litany of concepts and terms that are largely foreign to the populace at large. To brush up on this aspect of the medical field, read as much and as frequently as possible. Read textbooks, read journals and reports, and read articles related to the medical field. This will allow you to catch a glimpse not only of terminology, but of usage as well.

Study terms and their usage. While vocabulary is essential to communicating and understanding others in the medical field, you must not only be able to identify the meanings of words, but also be able to put those words into action and place them properly in sentences. Be sure to also study context and placement.

Common Medical Prefixes and Their Meanings

Medical prefixes function the same way that standard prefixes do; they are used to alter the meaning of a root word. In the medical field, prefixes are usually used to describe the state of a patient, or a procedure. Here is a list of the most common medical prefixes and their meanings:

A/Ah — Without

Arteri — Artery

Arthro — Bone joint

Bi — Twice/double

Carcin — Cancer

Chol — Bile

Cis — On the same side of

Crani — Head/skull

Cyt — Cell

Derm — Skin

Ect — Outer/outside

Ferri — Iron

Gyn — Woman

Hema — Blood

Hist — Tissue

Hyster — Uterus

Kerat — Cornea

Kinesi — Movement

Lacto — Milk

Leuko — White

Mast — Breast

Melan — Black

Necro — Death

Onco — Tumor

Osseo — Bone

Pan — All/entire

Common Medical Suffixes and Their Meanings

Like traditional suffixes, medical suffixes are used to bring further clarity to a root word and are attached to the end of a root. These words are frequently applied to words to denote an operation or procedure. The most common medical suffixes are identified as follows:

Ac/Acal — Of/pertaining to

Aemia — Blood condition

Algia — Pain

Centesis — Surgical puncture

Crine — To secrete

Cyte — Cell

Dynia — Pain

Ectasis — Expansion/dilation

Ectomy — Surgical procedure/removal

Genic — Formative

Gnosis — Knowledge Graph — Record/picture

Iasis — Condition

Iatry — Field of medicine

Icle — Small

Ismus — Spasm/contraction

Itis — Inflammation

Lysis — Destruction/separation

Oma — Mass/collection

Penia — Deficiency

Pepsia — Digestion/digestive tract

Plasty — Repair/reconstruction

Plexy — Stroke/seizure

Rrhagia — Rapid flow of blood

Scopy — Viewing

Tensive — Pressure

Common Vocabulary Concepts

“Vocabulary” is a word used to describe one’s verbal arsenal. Your vocabulary reflects significantly upon your breadth of knowledge, as it reveals how much exposure you have had to advanced concepts—not merely in the medical field, but in all academia, and even in day-to-day life. Someone with a well-rounded vocabulary is capable of retaining language needed to function on a coherent level with other adults and of engaging in more “high-minded” discussion, such as current events or academic concepts.

The greatest asset in developing a solid vocabulary is the ability to read thoroughly and efficiently. While some amount of your vocabulary can be developed through speaking and practice, reading exposes you to words you might not encounter any other way, and it reveals methods of speaking you might not have considered outside of your social circle. To develop a well-rounded vocabulary, place your primary focus on reading items of all natures, ranging from magazine articles to academic journals, to novels. Exposure is key to nurturing an expansive vocabulary.

To assist in your development, three basic vocabulary concepts are identified: prefixes, suffixes, and root words.

Prefixes

A prefix is an add-on placed ahead of a word to change or enhance its meaning. “Pre” is an example of a prefix used to denote “before.” “Post” is another prefix used to denote “after.” The following is a list of the most common prefixes and their meanings.

Anti — Against

Co — With/alongside

Dis — Not

Ex — Out of/former

Il/Im — Not/without

Inter — Between

Non — Without

Omni — All/every

Post — After

Pre — Before

Sub — Under/below

Trans — Across

Un — Not

Suffixes

Suffixes are the opposite of prefixes; they come after a word, though they are still used to change or further explain a root word. Suffixes can be more difficult to identify than prefixes, but as you read, you will find that you are familiar with most of the common suffixes used in the English language today. The most frequently used suffixes denote the passage of time.

Here is a list of the most common suffixes.

Able — Capable/capable of being

Ate — Become

Dom — Place/state of being

Er — More than/one who

Esque — Like/reminiscent of

Ful — Notable for

Ish — Having the quality of

Ist — One who

Ment — Condition of

Ness — State of being

Ship — Position held

Y — Characterized by

Roots

Roots are words that contain the idea or thought being prevailed upon by prefixes and suffixes. In the word “beautiful,” for instance, the root of the word is “beauty,” while the suffix is “ful.” Roots can be difficult to identify because they may require alteration to function with a prefix or suffix, as in the case of “beautiful.” For this reason, it is pivotal to familiarize yourself with common prefixes and suffixes; once you are familiar with the most common ones, you can more readily discover the root of words bearing additions. A few examples are given as follows:

Preview: “Pre” is the prefix, while “view” is the root.

Interchangeable: “Inter” is the prefix, “change” is the root, and “able” is the suffix. Fanciful: “Fancy” is the root, while “ful” is the suffix.