

**EVALUATING
ACADEMIC READINESS
FOR APPRENTICESHIP TRAINING**
Revised for
ACCESS TO APPRENTICESHIP

**COMMUNICATIONS SKILLS
VOCABULARY**

AN ACADEMIC SKILLS MANUAL
for
The Construction Trades: Mechanical Systems

This trade group includes the following trades:
Electrician, Network Cabling, Painter & Decorator,
Plumber, Steamfitter, Sprinkler & Fire Protection, and
Refrigeration/Air Conditioning

*Workplace Support Services Branch
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In preparing these Academic Skills Manuals we have used passages, diagrams and questions similar to those an apprentice might find in a text, guide or trade manual.

This trade related material is not intended to instruct you in your trade. It is used only to demonstrate how understanding an academic skill will help you find and use the information you need.

COMMUNICATIONS SKILLS

IDENTIFICATION OF MAIN IDEA

*An academic skill required for the study of the
Construction Trades: Mechanical Systems*

INTRODUCTION

As you learn trade information, you will come across distinctive words that describe techniques and materials used in the mechanical construction trades. There are many reasons you need to be familiar with the language of your trade: to understand what you read in manuals and textbooks, to talk with other workers and trades people, to read blueprints, and to accurately interpret the material in codebooks, technical manuals, specifications, safety manuals and contract documents.

When you are first involved in the trades, you will come across terms that you don't recognize or understand. These words won't go away, and you will need them. If you develop *word attack skills*, you will be able to quickly learn the vocabulary of the construction world. You will then be able to understand and speak the language of your trade with others. And, you will be able to comprehend and follow written materials.

In this skill sheet, we look at developing *word attack skills*. We suggest three methods to do this:

- ◆ Context clues
- ◆ Word parts: root, prefix and suffix
- ◆ Use of glossary and dictionary

PART I

CONTEXT CLUES

Your boss gives you a project to complete or your teacher assigns a major project. To deal with either assignment, start with the description of what you are to do, whether it is written or spoken. As you look at the instructions, you might find that you don't understand the meaning of some of the words. There are a number of reasons why a word may stump you:

- You have never heard or seen the word before.
- You are familiar with the word, but it's being used in a different way.
- It is technical or trade-related and you are new to the trade.
- It is an abbreviation unknown to you

Whatever the reason, you need a systematic approach to find meanings for these unfamiliar words. We will begin by trying to find meaning from the text itself.

The context

A new word is often used in a sentence, so this is the first place to search for its meaning. The sentence or paragraph where you find a new word is called its **context**. If you read slowly and carefully, you can guess – with reasonable accuracy – what an unfamiliar word means. Meanings of a word are given in a sentence by using:

- A. Definitions,
- B. Examples,
- C. Contrasts.

Learn to become an observant reader. This approach will help you recognize clues in sentences. Usually context clues are found right after or close to the new word. We will look at the ways that signals alert you to the fact that the meaning of a new word is being given. Context clues contain **signals** within the sentence that will help you recognize that the meaning of a new word will follow

NOTE: It's important to note that the clues that signal meaning have other uses as well. In other words, they do not always signal meaning or definitions for words.

A. Definitions

In technical and trade material, writers define and explain words – often they do this as a starting point. A definition tells you what something means, what it is or what it does. Watch for sentences that define a word or term.

Examples:

Attenuation is a decrease in the power of some sort of signal.

Files are made of heat treated, high-carbon steel and are used to smooth and shape parts by hand. They are hard and brittle and will shatter easily against hard surfaces.

Throttling is the expansion of gas through an orifice or controlled opening without gas performing any work as it expands.

These examples define a term or word; the words “*is*” and “*are*” are used to let you know a definition is being given followed by further information about the word. Notice that the second example uses the word *brittle*. If you are not sure about its meaning, the rest of the sentence helps define its meaning or characteristic: *it will shatter easily against hard surfaces*.

- ◆ Examples using *is* and *are* to define a word can be combined with italic or bold print to get your attention: *Italic print looks like this*, while **bold print looks like this**.

Example:

A **magnetic compass** is an instrument used to determine geographical direction.

We also use variations of *is* and *are* to explain terms

Examples:

- is known as:* The range of electrical frequencies that a device or medium can support *is known as* the bandwidth
- is called:* The amount of resistance or opposition a material offers to the flow of magnetic lines *is called* reluctance.
- means:* An adiabatic process *means* a thermodynamic process in which no heat is transferred to or from the working fluid.
- is referred to as:* The mechanism that pumps fluid by using a rotation motion *is referred to as* the rotary compressor.

It is essential that you understand and learn new vocabulary as you go. These terms will be used again, and you will be expected to become comfortable with them in order to build a trade vocabulary.

Example:

A *balun* is an **impedance**-matching device that allows conversion from one medium to another.

To understand the word *balun*, you need to know what *impedance* means. Impedance is the total effective resistance of an electric circuit to an alternating current, arising from ohmic resistance and reactance. The terms *impedance*, *effective resistance*, *alternating current*, *ohmic resistance* and *reactance* would have been explained earlier. They are used here without an explanation on the assumption that they are now part of your new vocabulary.

Sometimes the word **or** gives you another meaning or word for a new word or trade term.

Examples:

Thermometers have scales that may be divided or *calibrated* in various ways.

Proper lubrication reduces the wear or **friction** between components and increases component life by reducing wear.

We may not know the definition of “calibrate” or “friction” but we know what “divided” and “wear” mean.

Parentheses

Parentheses look like this () and they often signal a definition.

Examples:

The periphery (outside edge) of a rotating object moves at a particular velocity.

A greater electron flow can be created by increasing the amount of wire conductor cutting (passing) through the magnetic field.

This lack of cohesion allows a gas to diffuse (expand) quickly and broadly.

Parentheses also frequently signal an alternate word or expression.

Examples:

The Canadian Standards Association (CSA) was chartered in 1919, and is a not-for-profit, non-statutory, voluntary membership association engaged in standards development and certification activities.

Polyvinyl chloride (PVC) is used primarily in pressure pipe applications.

Abbreviations

Usually a term is written in full the first time it is used, followed by the abbreviation in parentheses. After that, *only* the abbreviation is used. These examples appear later in the same text as the example above.

Examples:

CSA Standards are subject to periodical review and suggestions will be referred to the appropriate committee.

PVC pipe and fittings are available in 3/8 inch and 6 inch diameters.

You understand CSA and PVC, having already seen them along with the words in full.

Other relevant standards are ANSI and NEMA.

RARP is the protocol by which TCP/IP workstation determines its own IP address.

There is no definition here for ANSI, NEMA, RARP or TCP/IP. You have go back to find where they were first used to find their meaning. Or, you could look in a glossary or list of terms.

Commas and Dashes

Commas (,) and dashes (–) are also used to signal a definition or an alternate way of saying something.

Examples:

The wire is heated to a white heat, called *incandescence*, which is what produces light.

The properties of brass, an alloy of copper and zinc, depend on the proportion of its parts.

Alnico - an alloy of aluminum, nickel, and cobalt – is the most powerful magnetic substance known.

A grab bar – a metal bar installed near a shower stall, bathtub or other fixture – provides extra support.

NOTE: Punctuation marks such as commas and dashes are used in a variety of ways, not just to signal examples or definitions.

B. Examples

A definition is a starting point. For full understanding you may need an example. Watch for a clue or signal. The example may be in clear language that you cannot miss.

Examples:

Analog devices monitor conditions such as movement, temperature and sound, and convert them into analogous electronic or mechanical patterns. For example, telephones turn voice vibrations into electrical vibrations of the same shape.

A liquid is said to be volatile if it changes readily from a liquid to a gas. For example, gasoline that is heated converts into a vapour that occupies more space.

The words *for example* tell you that what follows is an example. Other signals are not so direct. Watch for the words *such as, like, including*

Examples:

Diagrams include many different aspects, such as line or ladder diagrams, cutaway diagrams or exploded diagrams.

Good conductors like silver, copper, gold and aluminum are common materials.

Common toxic gases in construction include carbon monoxide from engine exhaust and hydrogen sulphide in sewers.

Two dissimilar metals, such as copper and iron, can be welded together to form a junction.

C. Contrast

Sometimes you can figure out an unknown word because you understand a word that is its opposite. Try to determine the meaning of *opaque* by using its opposite.

Example: If the mixture is **opaque**, it will not be suitable; on the other hand, a **translucent** mixture will allow some light to pass through the object making it a suitable choice. A transparent mixture will let too much light through.

If a translucent mixture lets some light through and a transparent one lets more light through, we can reason that an opaque one does not let any through. By a process of reasoning, you can get closer to understanding the word even if you do not have a dictionary nearby.

Some common signals for contrast words are *but, however, though, on the other hand, and whereas*.

In addition

The punctuation marks semi-colon (;) and colon (:) often signal an explanation or additional information.

Example:

The economy was in a state of **flux**; inflation increased one month and decreased the next.

After the semi-colon, (;) you find the meaning for *flux*.

Putting it together

Sometimes, several different context clues are combined.

Example:

Ferrous metals, such as iron, *oxidize* (that is, combine with oxygen) to form iron oxide - rust.

We've underlined the context clues here:

Ferrous metals, such as iron, oxidize (that is, combine with oxygen) to form iron oxide — rust.

Here is a passage using context clues. Look at how it works (and keeps on working) to make sure you really get it. It uses a variety of signals to get across a complicated explanation.

Read the passage and underline the context clues, built-in definitions and/or restatements that you find. Suggestions are underlined at the end of this skill manual.

The Electric Series

The accompanying list of substances, called the *electric series*, is arranged so that each substance is positive to all that follow it in the list and negative to all that precede it; that is, any substance receives a positive charge when rubbed with a substance listed after it in the series. For example, glass when rubbed with silk receives a positive charge and when rubbed with fur receives a negative charge.

PART II

WORD PARTS

Another method used to work out the meaning of new words is to break the word into parts to see what the parts mean. For example, *bicycle* has two parts: *bi* means two, and *cycle* means wheel. In the same way, we get words like *tricycle* (*tri* = three) and *motorcycle*, and so on.

Word parts

The basic part of the word is the root; the part added at the beginning is the **prefix**; the part added to the end is the **suffix**. Here's an example with the three parts:

dis order ly

You can see the root, *order*, and how the prefix, *dis* (when added) changes the meaning of *order* to its opposite. The ending *ly* answers the question *how?* or *in what way or manner?* "How were the tools laid out? In an orderly (or disorderly) way.

When you pull words apart and look at the pieces, you can often figure out what the whole thing means.

Root words

The root word carries the basic meaning of a word. When you understand the meaning of the root of a word, you can often make a good guess at an unfamiliar word. Here's a short list of root words and their meanings:

| Root | Meaning | Sample |
|-------------|------------|---------------------|
| dict / dic | say / tell | predict |
| duc / duct | lead | conduct |
| fac / fact | make/do | manufacture |
| flux | flow | fluctuate |
| port | carry | transport |
| vert / vers | turn | invert |
| scribe | write | inscribe, prescribe |

New words may not be so new

The root word is the real building block of a word. There are several hundred; the list above gives some common examples.

We will look more closely at the root word *vis / vid*. You know the meaning of *visible*, *video*, *invisible*, *vision*, *television*. You don't have to think about what these words mean because you know. But, if you know that “*vid*” means “*see*”, you can use your knowledge to understand a variety of new words that are related by the root *vis / vid*.

Try this with a different root word. The root word *vers / vert* means *turn* and it has many relatives. Can you guess the meanings of these *vers/vert* words? In fact, some new words may not be so new after all. **Answers are at the end of this skills manual.**

1. invert / inversion
2. convert / conversion / convertible
3. revert / reversion
4. divert / diversion / diverse

Prefixes

The part added to the beginning of a word is the *prefix*. Here is a list of prefixes used in your trade. They tell the amount of something.

| Prefix | Symbol | Amount |
|--------|--------|----------------|
| milli | m | one-thousandth |
| centi | c | one-hundredth |
| deci | d | one-tenth |
| kilo | k (K) | one thousand |

Some words can be changed in form slightly and used as prefixes. When used as a prefix, they change or add to the meaning of the root word. “*Electro*” which means having to do with electricity, is the first example. The three words below all have something to do with electricity. (We have separated the prefix from the root in the list below to emphasize the two parts).

electro chemical

electro lytic

electro meter

Here are three more words commonly used as prefixes in your trades:

1. *Hydro* means *water* (Greek) and is used in:
hydro carbon de hydr ation hydr aulic
2. *Thermal* means *heat* (Greek, again) and is used in:
thermo stat thermo meter
3. *Ferro* means *iron* (Latin), and is used in:
ferro chromium ferrous alloy

When you know that *hydro* means water, you know that the first three words above have something to do with water. Similarly, when you know that *thermo* means heat, and *ferro* means iron, you know the second and thirds groups have something to do with heat and iron.

You may still need a dictionary or glossary for a definition, but you can see that patterns in words will help you find the meaning of new words. *When you pull words apart and look at the pieces, you can often figure out what the whole word means.*

Here is a list of common prefixes with their meanings. As with anything new, tackle the project step-by- step, and practice what you are learning until it is part of your language.

Prefixes referring to *amount or number*

| Prefix | Meaning | Example |
|---------------|----------------|----------------|
| uni | one | unit /unify |
| bi /di | two | dioxide |
| deci | ten | decimal |
| equi | equal | equivalent |
| mono | one | monolithic |
| poly | many | polyurethane |

Prefixes meaning *not or negative*

| Prefix | Example |
|---------------|----------------|
| anti | antifriction |
| dis | displacement |
| im | improper |
| mis | misalign |
| non | non-ferrous |
| un | unfused |

Prefixes meaning *direction, placement or location*

| Prefix | Meaning | Example |
|---------------|----------------|--------------------|
| ante/pre | before | precede |
| con/com /col | with, together | compress |
| dia | through | diameter |
| sub | below | subzero, subnormal |
| trans | across | transform |

Suffixes

A suffix appears at the end of a word and changes its meaning. Here are some examples with their meanings:

| Suffix | Meaning |
|--------------|------------------------|
| able / ible | able to |
| ous | full of |
| er /or / ist | one or thing that does |
| al | about |
| tion | the act of |

Combining a root with a suffix produces something different – though related. For example, *retain* means “hold in or hold back”. *Retention* is “the act of holding in or back”. *Flux* means to “flow or to change back and forth” - fluctuation is “the act of flowing, changing, or rising and falling”.

Here are a few words with suffixes, commonly used in your trades.

| Root (with prefix) | with Suffixes |
|--------------------|--------------------------------|
| adhere | adhesive, adhesion |
| resist | resistance, resistor, resisted |
| compress | compression, compressor |
| condense | condensation, condensor |
| conduct | conductor, conducting |
| fabricate | fabrication |
| oxygen | oxygenate, oxydize |
| permeate | permeable |
| reproduce | reproduction |

When you take a word apart, you can see each of the pieces. As you examine each piece, you begin to see how it works on its own and with the other pieces. It is not very different from taking machines apart to see how they work.

PART III **GLOSSARY AND DICTIONARY**

Glossary

A ***glossary*** is a mini dictionary found in a manual or textbook. A glossary lists the words used in that manual or text to help you understand terms *as they are used in that book*. You will find a page reference for a glossary in the Table of Contents so you can find it easily. Sometimes a short glossary (or list of key terms) is placed at the end (or beginning) of a chapter or section

Examples:

Schematic: A diagram representing an electrical system.

Spectral characteristic: A graph that shows the sensitivity or relative output as a function of frequency for any frequency-dependent device, circuit or other equipment.

Isothermal: Changes of volume or pressure under conditions of constant temperature.

You can see that the definitions are not like those in a standard dictionary. A glossary:

- is designed for the text it is in,
- may direct you to an alternate word, and
- gives you specialized meanings.

Find out where the glossary is in each manual or book that you use. Refer to it before, during and after your reading to find the meanings of the words you encounter.

Check for any other list of trade terms. Some texts have all the trade abbreviations listed alphabetically at the back of the book. If you forget one, you can find it there. Note that some texts may call the glossary something else: *Shop Terms* or *Trade Terms* are possible alternatives.

A glossary is an essential tool but it may not give you definitions of everything you need. For instance, you may not find some of words we've used in Parts I through II - familiar but not necessarily related to your trade alone. For words like this, you need to use a dictionary.

Dictionary

A *dictionary* lists words in alphabetical and explains their meaning. Dictionaries can define words in general usage. There are also specialized dictionaries that define words used in a precise way, such as trade dictionaries.

Standard dictionaries

A standard dictionary will give you meanings for words that are non-technical or non-trade. If you miss key words in a passage, you can get side-tracked. If you miss important words, you are not getting information you need. This puts you at a disadvantage.

Example: You read that the *adjacent* panel will receive damage. *Adjacent?* Does this mean beside, under? What if you do not understand such words as, *succeeding* strips or *consecutive* numbers?

Trade or specialized dictionaries

One of the most important tools to develop the technical reading, writing and speaking vocabulary of your trade is a good dictionary. A specialized trade dictionary will give you meanings as they apply to the industry.

I still don't get it!

When you come to a word that you can't figure out using context or the root word, stop and go to a dictionary. Try this system:

1. Write down the word when you read or hear it. It's almost guaranteed that you won't remember the word unless you write it down. It's new!
2. Look it up. Find the appropriate meaning – there may be several.
3. Write out the definition.

4. Write out some examples and put the word in a sentence.
5. Test your understanding of the new word the next day.
6. Use it or lose it; practice it until you know it.

Using a system

Have you ever looked for a single sock in a drawer full of socks? Then you know a system - other than the jumble system - is essential. In Parts I through III, we looked at methods to develop *word attack skills*. The success of any method depends on several factors: applying it consistently, and developing a system for retrieving what you have learned.

Find a system that works for you. Develop a notebook, your own dictionary, or index cards with new words to practice. There is no wrong way to learn new words. Remember, if you say “I need that black thingamajig with little wires coming out of it,” you may not get what you need.

CONCLUSION

You can expect that many trade and trade-related terms will be taught in the classroom, in textbooks and in manuals. However, you'll need to put in time and make an effort to learn these words so that they belong to you.

Unknown words are just that - new or unfamiliar to you. They can make you feel baffled by what you are reading. But, if you know the problem, you can fix it. Acquiring a trade vocabulary, in spite of the time and effort, is worth achieving, both for yourself and your customers.

Summary

1. **Use the context clues** found in a sentence and paragraph that define, explain or give examples of a word.
2. **Narrow in on the word itself:** use the root, prefix and suffix. Take the word apart, look at the pieces and put it together again. Develop vocabulary by building from the roots.
3. **Use the glossary** (or list of trade terms). In some textbooks, it's placed at the beginning of a chapter to prepare you for what's ahead.
4. **Use a dictionary.** A specialized trade dictionary will define and explain words specific to your trade.
5. **Use a system** to learn, remember and use technical and non-technical terms.
6. **Read carefully to understand.**

ANSWER PAGE

PART I Context clues for The Electric Series, page 6.

The underlined words indicate a context signal: a definition, explanation, or example will be provided.

The Electric Series

The accompanying list of substances, called the *electric series*, is arranged so that each substance is positive to all that follow it in the list and negative to all that precede it. That is, any substance receives a positive charge when rubbed with a substance listed after it in the series. For example, glass when rubbed with silk receives a positive charge and when rubbed with fur receives a negative charge.

Let's look at each sentence:

1. The first clue is a **definition** it tells us what the electric series is.
2. The second clue uses the words *that is* to further **explain** how the list works.
3. The third clue uses an **example** of what we would find on the list, and therefore, how it works.

PART II Meanings of root, “vers” or “vert”, plus prefix and suffix, page 7.

Each of the words contains *vers* or *vert* and, therefore, means something related to “turn”. The prefixes indicate something about how or in what direction. By looking at these relatives, you may see patterns that will help you understand new words.

- | | | |
|----|--------------------------------------|---|
| 1. | invert inversion | to turn upside down the act of being turned upside down |
| 2. | convert conversion convertible | turn or transform the act of converting (changing, turning into something else) able to be changed (turned into something else) |
| 3. | revert reversion | to turn back the act of turning back |
| 4. | divert diversion | to turn away the act of turning away or being turned away or aside |