

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

**COMMUNICATIONS SKILLS
VOCABULARY AND WORD ATTACK SKILLS**

**AN ACADEMIC SKILLS MANUAL
for
The Industrial Maintenance Mechanic Trades**

This trade group includes the following trades:
Boiler Maker,
Facilities Maintenance Mechanic & Technician, and
Industrial Maintenance Mechanic (Millwright)

*Workplace Support Services Branch
Ontario Ministry of Education and Training*

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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

VOCABULARY AND WORD ATTACK SKILLS

*An academic skill required for the study of the
Industrial Maintenance Mechanic Trades*

INTRODUCTION

As you learn about the industrial maintenance mechanic trades, you will come across distinctive words used to describe precise techniques and materials. There are many reasons why you need to be familiar with the language of your trade. Knowing trade vocabulary is essential to understanding what you read in manuals and textbooks. It helps you describe ideas clearly to clients and other workers. You must understand trade terms in order to read drawing and to accurately interpret the material in codebooks, technical manuals, specifications 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 will not go away, and you need to learn them. If you develop *word attack skills*, you will be able to quickly learn the vocabulary of the mechanical 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 instructions, or your teacher assigns a major project. To deal with either assignment, start with the meaning of the words, whether the words are written or spoken

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's technical or trade-related and you are new to the trade.
- It's an abbreviation unknown to you.

Whatever the reason, you need a systematic approach to find the meanings of these unfamiliar words. We'll 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. Contrast

We will look at how signals can alert you to the fact that the meaning of a new word is being given.

NOTE: *It's important to remember 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:

Linear Motion is motion in a straight line. This movement has linear velocity (speed and direction), acceleration, and deceleration.

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.

These examples define a term or word; the words “*is*” and “*are*” let you know a definition is being given. 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: *it will shatter easily against hard surfaces*.

The signals *is* or *are* can be combined with italic or bold print to get your attention: *Italic print looks like this*, while **bold print looks like this**.

Example:

Seams *are* various types of bent and hooked edges used to join two pieces of sheet metal

We also use variations of *is* and *are* to explain terms. Some variations you will see are: *is known as*, *is called*, *means*, *is referred to as*.

Examples:

is known as: A series of interconnected links made of wire or rod *is known as* a **chain**.

is called: Any process of heating and cooling that produces a round or globular form of carbide in steels is called spheroidizing.

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 property of a material that allows it to be drawn out of shape before fracturing by stress is referred to as ductility

It is essential that you first understand, and then 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:

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

Friction refers to the tendency of components to resist movement when their surfaces are in contact when they move. This term was probably explained earlier in the text. It is used here without an explanation, based on the assumption that it is now part of your new vocabulary.

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

Examples: Case hardening is a process of hardening a ferrous alloy so that the “case” or surface layer is much harder than the interior of the part.

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

We may not understand what “case” or “calibrated” means but most of us understand what “surface layer” and “divided” mean. Using what we already know leads to understanding the new terms.

Parentheses

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

Examples:

Bearing manufacturers' tables indicate the maximum shaft diameters (fit) for specific bearings.

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

Parentheses also frequently signal an alternate word or expression.

Example:

The cutting speed (CS) is the speed with which the saw teeth and cut object move past each other.

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.

Example:

The rpm at which the power tool must rotate for a particular cutter diameter is determined from the CS.

You understand CS, having already seen it along with the word in full.

Here is an example where you might not know what the abbreviation stands for.

Example: Tapered roller bearings have a standard code designation, giving the ID of the cone and OD of the cup.

There is no definition here for ID or OD. You have to go back to find where the word was first used to find the 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 teeth are set (bent) from side to side so the kerf, the opening cut, will be large enough for the blade to run freely.

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

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. It may be in clear language that you can't miss.

Example: A liquid is said to be highly volatile if it changes quickly 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: Two dissimilar metals such as copper and iron can be welded together to form a junction.

A fastener can be fired into hard materials, including concrete, mild steel and masonry.

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 below and underline the context clues, built-in definitions and/or restatements that you find. Possible answers are at the end of this skills manual.

Alloys

Alloys are mixtures of a metal with other metals or non-metals. For example, brass is an alloy of copper and zinc. Like any other mixture, an alloy's properties depend on the proportion of its parts. For example, you can vary the proportions of copper and zinc to produce different effects: a bronze coloured alloy has 90% copper and 10% zinc; a silvery white alloy has 55% copper and 45% zinc. Brass is produced in about a dozen formulations each with its own distinct characteristics.

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 is 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 entire word 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 is 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.

Example: Consider the root word *vis / vid*.

You know that words like *visible*, *video*, *invisible*, *vision*, *television*, all have something to do with seeing (or not seeing) something). You can use this knowledge to understand other 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 measurement to 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 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's a list of common prefixes with their meanings.

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	cross	transform

Suffixes

A suffix appears at the end of a root 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

When you add a suffix to a root, it changes something about the word.

Examples:

Retain means hold in or hold back. *Retention* is the act of holding in or back.

Flux means to flow or to change continuously - *fluctuation* is the act of flowing, changing, or rising and falling.

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

Root (some with prefixes)	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

Words in a glossary are defined as they relate to a particular trade.

Examples:

Backlash: A term used to describe the amount of play between mating teeth in a gear drive, measured in thousandths of an inch.

Fatigue: The tendency for a metal to break after repeated or cyclic loadings that are below the ultimate tensile strength.

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

- is specifically designed for the book 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 of words, or make index cards with new words to practise. 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 it to you 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 Alloys

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

Alloys

Alloys are mixtures of a metal with other metals or non-metals. For example, brass is an alloy of copper and zinc. Like any other mixture, an alloy's properties depend on the proportion of its parts. For example, you can vary the proportions of copper and zinc to produce different effects: a bronze coloured alloy has 90% copper and 10% zinc; a silvery white alloy has 55% copper and 45% zinc. Brass is produced in about a dozen formulations each with its own distinct characteristics.

Let's look at each sentence:

1. The first clue is a **definition**: it tells us what an alloy is.
2. The second gives us an **example** of an alloy: brass.
3. The third clue uses **comparison and explanation**: we know that an alloy's properties are "like any other mixture" in that they "depend on the proportion of its parts."
4. The fourth gives us different **examples** of alloys affected by proportion: "bronze coloured" and "silvery white" alloys.
5. The last context clue is an **explanation** of how one alloy, brass, can be made from many different formulations resulting in different characteristics.

Part II Meanings of root, "ver" or "vert", plus prefix and suffix

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