

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

**COMMUNICATIONS SKILLS
IDENTIFICATION OF MAIN IDEA**

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
Ontario Ministry of Training, Colleges and Universities*

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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

The **main** idea of anything is the central purpose or point of a series of ideas or thoughts. The main idea of the installation of the mechanical systems in any building project is to properly and efficiently install all of the systems so that the finished project is properly operational. Everyone who is part of the construction team is there to contribute his or her expertise to that main idea.

As you study your trade, you will learn many new skills through reading textbooks and manuals. Identifying the main idea as you examine written material and as you watch a technique being demonstrated will help you sort through the information. Then you can find what you want and focus on the exact part that has the ideas or facts that you need. Just as cable, wires, drains, duct work, conduits, insulation, and workplace safety are each necessary parts to the mechanical structures of any building, the ability to understand main ideas is essential to your reading strategy toolbox

The practical applications of this reading skill range from understanding the functions of materials, tools, and hardware, to reading and correctly interpreting any written materials in your course of study. Note taking and study skills are enhanced by the ability to master this skill.

This manual will help you identify the main idea in technical material so that you can recognize what is important. We will look at how technical material is organized and suggest ways to find the main idea in that material. We will look at the following:

- ◆ Titles, headings and descriptions as guides to the main idea.
- ◆ Focussing on the main idea.
- ◆ Topic sentences and paragraphs.
- ◆ Supports to the main idea.
- ◆ An Approach to Reading.

PART I

TITLES, HEADINGS AND SHORT DESCRIPTIONS

Organization of Technical Material

Technical material usually gets you to the main idea quickly in the following ways:

- ◆ Titles, headings and short descriptions indicate the main ideas of each section.
- ◆ Information is grouped in a logical pattern by topic, chapter, section, and paragraph.

- ◆ The introduction to the topic usually comes near the beginning, so you get to the main idea and the purpose of the writing immediately.
- ◆ Individual chapters usually start with basic concepts and move to more detailed knowledge after the general introduction to the main idea.

Titles: Finding the Main Idea

When you need to read technical material, look at the document title or name. The title will give you a good general idea of what the material is about.

Compare this to finding equipment in a well labeled drawer. A label makes short work of getting ready to do the job before you even start. Reading labels will help you find information quickly.

Example: When you open a drawer labeled *Tools*, you expect to find tools. The label tells you what's inside. Everything in the drawer should be a tool – maybe hammers or wrenches, maybe all kinds of tools. If the label says *plug caps*, then everything inside should be a chisel. A label doesn't give details; it doesn't describe the number or condition of what's inside. The label provides an idea of what's there - and of what's not there.

Titles, headings and sub-headings

Think of a textbook, manual, chapter, or paragraph as a drawer. A drawer can store equipment and supplies, while a textbook or manual stores information. This information is labeled with ***titles, headings*** and ***sub-headings*** so you know what's inside.

Example: Headings you might find in a trade manual.

Lighting Equipment
Wiring of Lighting Equipment
Electric-Discharge Lighting Systems

Each heading tells what the different sections are about. The first heading, **Lighting Equipment**, does not tell us any details about what the topic covers. It could be any or all of the following: a specific type of standard, what it means, problems and special considerations. But, we know for certain that it will be something about lighting equipment.

The second heading, **Wiring of Lighting Equipment**, gives you more information. You know what aspect of lighting equipment you will learn about: wiring it. Learning about wiring lighting equipment is the main idea of this section.

The third heading, **Electric-Discharge Lighting Systems**, tells you that you will learn something about a specific type of lighting system. It could be “how to” or safety procedures, but something about electric-discharge lighting is the main idea.

Usually titles or headings illustrate how the material in a text is organized. It starts with general topics and moves to more specific ones. The main idea of each section becomes more focused. Here is an example:

Hand Tools
Measuring Tools and Gauges

The first heading gives you a huge topic. Compare it to the second heading and notice how the second is more specific. It defines and limits the topic to specific types of tools, giving you a more precise idea of what you'll find.

Titles and headings are placed at the top of the text with **bold print** or CAPITAL LETTERS so they're easy to see. Charts and diagrams also have titles, and, often, short descriptions at the bottom or top. Titles provide visual clues that are easy to see and that direct you to the main idea.

A **heading** is a form of title designed to break information into smaller divisions. A **sub-heading** breaks it into even smaller divisions; a sub, sub-heading is smaller still.

Often, a new heading will signal when there's a change in the main idea. It will direct you to the next main idea. Always read titles and headings. They won't help if you skip them.

You'll find a list of chapter titles and section headings in the **Table of Contents** at the beginning of each text or manual. Make sure to check the Table of Contents before you start searching for information.

You might see this Table of Contents in a manual or text. Look at how information is broken into more and more focused topics.

ELECTRONICS	Textbook title
Trade Mathematics	Chapter title
Electrical Circuits	Unit heading
Series Circuits	Sub-heading
Parallel Circuits	Sub-heading
Kirchhoff's Laws	Sub, sub-heading

Let's look more closely at how information is organized in this Table of Contents. The same ideas of organization will apply to all texts, manuals or diagrams. Consider these four points about titles and headings:

One

Observe how much information you get about **main ideas from the titles**.

- The textbook title tells you the kind of information you will find: information about electronics.
- The chapter title **Trade Mathematics** lets you know what this chapter will cover.
- Under the chapter title, you see unit headings, sub-headings and sub, sub-headings.

Each title tells you what aspect of trade mathematics you will learn about.

Two

Note that each heading is a new main idea, but each one *stays on the main topic*

- *Electronics*, for the text title and
- *Trade Mathematic*, for the chapter heading

Remember, all the information you read will relate to the larger main idea: electronics, and all the information in a chapter will relate to the main idea of that chapter.

Three

As you read titles, from the textbook title down to the sub (and sub, sub) headings, you can see that topics *are more narrowly defined*. At each smaller heading, the topic covers a more limited or exact aspect of the main idea.

- The textbook title gives you a general, large main idea - electronics.
- The chapter title gives you a more specific topic (math in electronics).
- Unit headings give an even more specific topic / main idea (math in electrical circuits).
- Sub-headings divide that main idea into two still more specific groupings (math in series circuits and in parallel circuits).
- The sub, sub-headings divide these into even smaller topics: Kirchhoff's Laws.

By reading the titles and headings, you know quite a bit about what to expect in this chapter. It should all tie together.

Four

When you read titles, you can see the *order of the information*. You start at the beginning when learning a trade, and learn information step by step.

- The first chapter, the first textbook, the first manual are the foundation for the second chapter, second textbook and so on.
- The titles list the order in which you will learn individual topics.

This order shows you where you are going, and the steps you will take to get there.

In Brief

1. **The title** indicates what you will learn about.
 - Everything in this book will be about the main idea – electronics.
2. **Chapter headings** identify the parts that form the main idea and show the order in which those parts are presented.
 - Every chapter will be about some aspect of electronics – math, circuits and so on
3. **Headings and sub-headings** will identify information contained in the chapter.
 - All the headings within the chapter Trade Mathematics will be about a specific aspect of mathematics as it is applied to electronics.

PART II

FOCUSSING ON THE MAIN IDEA

Assessing a job

When you have a job or task to do, you need to be clear about it. “What is the job? How big is it? How long will it take? What problems can I foresee?” These are main idea questions.

You need to do the same thing with written instructions. Ask main idea questions: “What do I have to understand? What am I expected to do at the end? How long will this take?” Then look at the main titles and headings to find out where to start reading.

The Visual Check

A **visual check** is a preview of what you will be reading. Looking through a textbook before reading it will help you find information quickly. It provides an overall assessment of the reading material before you begin tackling it. If you are given a reading assignment in **Electronics**, look over the book first. These guides will help you identify the main idea:

- The chapter, titles and headings show how the information is organized.
 - Now, look for the heading that refers to the reading you need to do.
- When you find the heading you want, go to that section of the book.
 - Notice how long the passage is and if it is divided into smaller sections.
- Note the diagrams and read information around them.
 - If the information is new or looks complicated, you might take more time on it.

Seeing A Pattern

Every document follows a pattern of organization. Information is typically developed from general, large topics to more specific ones as details are added to the main idea. Watch for the pattern, so you understand where you are going and how you are getting there. When you recognize the pattern that a text or manual follows, you will have a pretty good idea of where to look for specific information in the document.

The organization of information will follow one of the following patterns:

- ◆ general to specific,
- ◆ most important to less important or vice versa,
- ◆ problem to solution, or,
- ◆ theory to application.

You will see other patterns too. You may learn why a procedure is important before you learn the steps, or you may learn the importance of each step as you go. Recognize the pattern and then focus on finding the information you need.

From main idea to details

Titles and headings give you a general idea of what you'll find but they don't give details. A drawer labeled *Tools* contains tools but doesn't say how many or what kind. Open the drawer; look at the contents. Take each tool out, or dump them all out. Now, you are getting the details.

Keep focused on the main idea

To get the details of a section of reading material, first do a visual check. After the visual check, read the material, paying attention to what it is telling you. If the material is complicated or new, you may need to split it into smaller portions. It helps to read a difficult part several times.

While you have to pay attention to the details that explain the main idea, don't get distracted from the main job by concentrating too much on a detail.

Example: You are organizing your tools (main job) and find a drill you lost six months ago, you pick it up, show it to the worker beside you, and wonder how it got here. You have been distracted by a detail from the job you are suppose to be doing.

The same thing happens with reading – you can be sidetracked.

Read Passage 1, below to find the main idea. Use the three steps below to guide you.

1. **Use the title** as a guide to the main idea and contents.
2. **Do a visual check** to look for headings, diagrams and length. Note anything that stands out such as large or bold print. This gives you some clues to the main idea.
3. **Read the passage.** Check the way that each sentence relates to the main idea.

❖ **Because this is a working sheet, underline or make notes that will help you. Note that we are examining main idea, not refrigerants.**

Passage 1

Refrigerants

Refrigeration service technicians must frequently handle refrigerants, charging them into refrigerating mechanisms. There are several different kinds of refrigerants and each has its own specific handling methods.

Refrigerants can be very irritating to eyes and lungs. Liquid refrigerant on the skin may freeze the skin surface, causing frostbite. Goggles and gloves should be worn at all times for protection in case of a sudden leak. Any accidents involving refrigerants should be immediately referred to a doctor.

Refrigerants are stored and handled in portable cylinders that are identified by a specific colour code. Different cylinders for different refrigerants must never be interchanged. In addition, refrigerant cylinders must never be filled over eighty percent of their capacity. Temperature increases may cause **hydrostatic pressure**, which can burst the cylinder.

Before answering the questions about main idea, we'll go through the three steps.

Step 1: Use titles and headings as keys to the main idea.

- The title gives you a guide to the main idea – handling refrigerants.
- You don't know exactly what the information is about.

Step 2: Do a visual check before you tackle the reading.

- The passage is three paragraphs long.
- Some words are in **bold type (hydrostatic pressure)**.
- There are no pictures or diagrams.

Step 3: Read the passage carefully.

- You see that there are ten sentences and each sentence refers to or describes something about the main idea – handling refrigerants.
- Each sentence contains details that relate to the main idea.

When you reach step 3, you are looking for details that relate to the main idea. You open the drawer and study the contents.

Answer questions 1, and 2 below. Answers are at the end of this skill manual.

Questions

- 1 a) In paragraph one, what is the main idea?
- 2 a). What is the main idea in paragraph two?
b) Give details from paragraph two that support the paragraph's main idea.
c) What is the main idea in paragraph 3?

Once you have found the main idea, the details will answer *what, how, why, when* types of questions. You also expect to find out how all of this relates to you and your trade.

What's it about?

Each sentence in Passage 1 relates to the title and topic of refrigerants; you have confirmed that this is the main idea. You have kept your focus on the main idea. By going through the process of identifying the main idea of each paragraph, you could now to tell another person what this passage is about. You can also separate the main idea from the details.

Apply this method to find the main idea in anything you read, whether it's for yourself or to explain a design, material or project to a client.

PART III

TOPIC SENTENCES AND PARAGRAPHS

In technical material, the topic sentence (usually the first sentence) tells you what the main idea is. The other sentences add to this idea. All of the sentences should have something to do with the main idea. Once you are sure about the main idea expressed in the topic sentence, **read the passage carefully**. Then ask yourself what it's about. The *usual rule* can help you find the topic sentence, *and* the main idea.

The Usual Rule:

1. Paragraphs and passages are set up with a key sentence called a topic sentence.
2. This topic sentence is usually the first one in the paragraph.
3. Topic sentences provide you with the main idea.

In Passage 1, **Refrigerants**, the topic sentence of paragraph one is the second sentence while in paragraphs two and three, the topic sentences are the first sentence

Paragraph one: *There are several different kinds of refrigerants and each has its own specific handling methods.*

Paragraph two: *Refrigerants can be very irritating to eyes and lungs.*

Paragraph three: *Refrigerants are stored and handled in portable cylinders that are identified by a specific colour code.*

These topic sentences prepare us for information to come. They say, “This is what we are going to talk about.” The remaining sentences explain or add details to the main ideas.

Below are two opening sentences that show how topic sentences work. These will be the topic sentences in passages 2 and 3. Anything that follows them in the passages should relate to these ideas; and should add details that expand your knowledge about these topics.

Read the topic sentences carefully and answer the questions which follow, even though you haven’t seen the rest of the paragraphs yet.

from Passage 2

Any time a metal is exposed to air, the oxygen in the air combines with metal to form an *oxide* of the metal.

from Passage 3

Oxides are important in that the characteristics of the oxide determine many of the characteristics of the metal.

Reread the sentences carefully and answer the following questions. Choose from the list below.

1. What is the main idea?

from Passage 2

- a) air and metal
- b) oxides of metals
- c) chemical films

from Passage 3

- a) characteristics of oxides
- b) the importance of oxides in metal
- c) how oxides determine metal characteristics

Before you check the answers at the end of this skills manual, read Passages 2 and 3, below.

Do you need to change your answers for 1 or 2? Do the first sentences work as the topic sentences? Why or why not?

Passage 2

Any time a metal is exposed to air, the oxygen in the air combines with metal to form an *oxide* of the metal. A familiar example of an oxide is the rust that forms on uncoated iron and steel (iron oxide). Similarly, the green chemical often formed on copper is an oxide of copper.

Passage 3

Oxides are important in that the characteristics of the oxide determine many of the characteristics of the metal. Iron oxide (rust) forms quickly and is porous and flaky. Because of the porous quality, moisture is allowed to seep through and form more oxide underneath. This causes flaking, which exposes more metal that will then form more oxide. Eventually, this action will eat through the metal, which explains why plain steel is a poor choice of metal to be exposed to corrosive conditions.

Does the *Usual Rule* apply? **Yes**, these work as topic sentences:

- They give the main idea and the other sentences build information from that idea.
- They present a logical order in which to develop information on oxides in metal.
- The usual rule applies.

NOTE: *If you aren't sure about the main idea after reading the first sentence in a passage, go to the second or third sentence. The main idea and direction of the passage should become clearer as you proceed. One idea or topic should emerge as the main idea.*

Topic paragraphs

Longer passages begin with a **topic paragraph**. They act like topic sentences. They will tell you what the whole passage or section is going to be about. These introductory paragraphs come first, are often short and give you main idea and purpose of what you are going to read.

In Brief:

1. Titles and headings give you information about the contents. They tell you what the textbook or passage is about, in other words, what the main idea is.
2. The next step is visual; you can “see” what to expect, and where the information fits in with the rest of the material.
3. As you read each paragraph, identify the topic sentence and the main idea of the paragraph.
 - The other sentences should add information or details to the main idea.
4. Identify the topic paragraph when you read a chapter or a longer section.
 - The other paragraphs should add information to the main idea.

PART IV

SUPPORTS TO THE MAIN IDEA

Supports to the main idea are the details that provide specific information. Supports may do any of the following:

- ◆ define or explain the main idea,
- ◆ describe how it works,
- ◆ illustrate how it operates,
- ◆ show the steps, or
- ◆ show the results.

Identifying supports to the main idea

Look at Passage 4 below. Read to see if the main idea is placed first - and what it is. Do the supports follow with details about the main idea?

Passage 4 Types of Magnets

There are two types of magnets: *natural* and *artificial*. An iron ore called lodestone is termed a natural magnet. Manufactured magnets, such as bar magnets and horseshoe magnets, are termed artificial. These are also classed as *permanent magnets*. Figures 3.5 and 3.6 show these magnets and their magnetic fields.

The *electromagnet* is another artificial magnet. Electromagnets are made by winding a few turns of insulated wire around an iron bar and passing an electrical current through the wire. They are termed *temporary magnets*. More detail about electromagnets will be found in a later chapter.

We should find a topic sentence in the first paragraph that gives us the main idea and prepares us for the supports to the main idea to follow. The supports might define or expand the main idea, describe a method, show (with diagrams, photos), or provide examples. Let's look at paragraph one to see if it works this way:

Paragraph one

Sentence one states: *There are two types of magnets: natural and artificial*. The main idea is magnets and the types. The **main idea** gives us **what** and **why** of one thing (magnets).

The next three sentences give us some facts and examples about two types of magnets, and we are told to look at two figures (omitted here) that help us visualize **what** these magnets look like and **how** they work.

Paragraph two

Paragraph two should continue the main idea (magnets) with details. The first sentence talks about a type of artificial magnet: the electromagnet. This tells us that the main idea in paragraph one is followed by more detailed information in paragraph two. Each supporting detail adds information about the main idea. We learn:

- how electromagnets are made,
- another term for electromagnets, and
- that more information can be found in a later chapter.

This passage about magnets shows a common pattern used in technical writing.

1. The **title** communicates the topic in brief.
2. The **topic sentence or paragraph** communicates the main idea in expanded form.
3. The sentences that follow add details.

Diagrams

Many reading passages will direct you to look at diagrams, illustrations or photos. These figures show you what something looks like or how it works. They relate to the main idea but they also add details. If a passage tells you to *See Figure 1*, you can expect a diagram, chart or table.

We'll use a simple diagram, Figure 1 below, to demonstrate how diagrams support the main idea. Look at the diagram to understand the main idea (how to produce electricity with a magnet). Read the text for both main idea and supports.

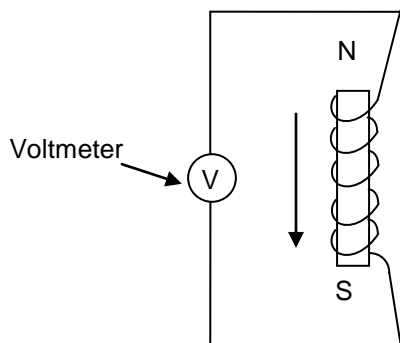


FIGURE 1: Producing Electricity with a Magnet:

Because you can produce magnetism with an electrical current, it should come as no surprise that electricity can also be produced with a magnet. Here, there is no electrical voltage source; instead, the material in the centre of the coil is a permanent magnet. If you move the magnet up through the coil of wire, an electric current will start to flow through the wire, just as it would with an electric conductor.

By studying the diagram and by reading the description with the diagram, you can see how to produce electricity with a magnet. The diagram gives support to the main idea and illustrates details you may not understand from reading the text alone.

Steps to Supports

Narrowing in on the supports to the main idea (details) is like starting a project.

1. First, you need to ask main idea questions:
 - a. What is the task (the job or the reading)?
 - b. How long will it take?
 - c. Where is it located?

2. Next you need to look more closely at the details and ask specific questions:
 - a. **What** manuals do I use?
 - b. **What** procedures and materials do I use?
 - c. **What** order will I use for the project and **why**?

3. Proceed carefully.
 - a. Stay focused on the purpose of the task.
 - b. Make sure that each part helps to accomplish the main purpose.

Getting the information you want

Getting what you want, whether you are reading for information or doing a job, involves seeing the big picture and then narrowing in on details. In this way you become knowledgeable, and you can make informed decisions. If you use this approach when you read for your trade, you will get the information you need to understand an aspect of your trade.

In Brief: The Three Steps

Step 1: See the big picture: Look at the title

Step 2: Get a better focus: Use the visual check to preview the reading

Step 3: Look more closely: Read for details.

Passage 5 might be found in a section of a text book on *Trade Science*. As you read it, apply the three steps.

Passage 5 **Physical States of Matter**

Matter exists in one of three physical forms or states: solid, liquid or gas. Substances change states without changing their chemical structure. In appropriate conditions, solids melt into liquids or vaporize, liquids freeze to solids or vaporize into gases, and gases condense into liquids.

When water changes its physical states the make-up of the molecules remains the same. Molecules of frozen water (ice) still contain two hydrogen atoms and one oxygen atom, chemically combined. Steam also contains these types of molecules. It is mostly a change in temperature that causes changes in the different physical states. Because of this, water can be made to return to a previous state by changing surrounding physical conditions.

Step 1: See the big picture. In a passage with the title, **Physical States of Matter**, you expect:

- Definitions and descriptions of the physical states.

Step 2: Get a better focus **by previewing** the passage.

- You see it has two paragraphs.
- One word, *ice*, is in parentheses (). Signals such as parentheses indicate explanation, definition or useful details.
- Find the topic sentence in paragraph one: *Matter exists in one of three physical forms or states: solid, liquid, or gas.*
- In paragraph two, the topic sentence has an important fact about physical changes of state: *When water changes its physical state, the make-up of the molecules remains the same.*
- Sometimes a diagram or table will be part of a passage. Make sure you always look at the text, charts, tables, and diagrams. Any details found in the diagrams will help you to follow the details in the reading. Also note if any information is highlighted.

Step 3: Read carefully for details.

- Check the supports (details) to see if they are guided by the title and the topic sentences.
- Look to understand the details which answer **what**, **how**, **how much** and **why** questions.

Make information accessible

When you need to understand a piece of technical writing, write down all the main ideas and a list of the supporting details. We suggest making a list of supporting details for two reasons:

1. You need to identify and find the details before you can work with the information.
2. You need to break down information, especially if it is long, complex, and detailed.

Identifying Types of Supports

When you recognize the type of support being used, it should help you find what you want quickly. Supports to the main idea include but are not limited to the following:

1. **Examples:** Examples take you from what you know to new knowledge. They give you a clearer picture of something or what it includes or how it works. The passage usually signals an example:

Strong electrolytes, *for example*, mineral acids, are compounds that are completely dissociated into ions when in solution.

For example, backflow is most likely to occur when water pressure drops in the water supply piping.

For example, ethylene glycol is an antifreeze because it lowers the freezing point of water.

Watch for examples that do not have the word *example* as a signal. The above sentence could be re-written as follows:

Antifreeze is a material, such as ethylene glycol, that is added to water to lower its freezing point.

2. **Order of Ideas:** Order of ideas (sequence) describes the parts or steps in a process. It is a common type of organization used in technical materials.

Usually technical information is presented first in a general introduction and is followed by more specific details. The opening or introduction may outline the content, the application and the importance of the information.

Example: Reamers follow the location of the drilled hole. Ensure that the drilled hole is located accurately before reaming. Holes to be reamed must be drilled undersize to allow the reamer to cut it to size. The amount of material left for reaming, depends on the type of reamer used....

Here is a step-by-step example with no introduction:

Example: Place the wrench on the bolt head (or nut), so the movable jaw faces the direction the fastener is to be rotated. Adjust the thumbscrew so the jaws fit the bolt head snugly. Then, pull the wrench to rotate the bolt.

Directions and instructions will start with the first step. Look for numbers or letters. Also look for lists or steps. Look for words such as *to begin with, first...second, then/next, before...after, in the same way, finally*. Remember, there is a reason for the order even if you don't know what it is.

3. **Definitions:** If the topic introduces a new concept or a technical word, you need an explanation of what it is before you know what it does. Technical terms are defined so you can understand the new word. Take note of special print or marks that are designed to get your attention.

Example:

"Elements" are materials containing only one type of atom.

Parentheses () may give you the correct, technical term, clarify a term or direct you to a diagram.

Examples:

Core loss (the total energy dissipation in the ferromagnetic core of an inductor or transformer) is mainly due to eddy currents and hysteresis loss in the core.

Rerods (reinforcing rods) are embossed steel rods placed in concrete slabs, beams or columns to increase their strength.

A definition tells you what a technical term means.

Examples:

The capacity of a wire or device to store an electrical charge is referred to as the *capacitance*.

Siphonage is a partial vacuum created by the flow of liquids in pipes.

A definition may state what something is or what it does:

Examples:

An electrical signal of a set frequency that can be modulated in order to carry data is called a **carrier**.

A **fixture drain** is drainage piping that connects a fixture and a branch waste pipe.

4. **Comparison and Contrast:** Comparisons show similarities and differences, while contrasts show differences only. Look for words such as *in contrast, some ... others, whereas, yet, on the other hand*. This is done to help explain, define and expand your knowledge of relationships

Examples:

Friction is a useful force that is needed in order for brakes and gears to work. At the same time, it can steal energy from machines in the form of heat and sound.

Base your working loads on “Safe Load Ratio” .The strength ratings are based on tests at room temperature; rope strength decreases with an increase of temperature. As it get warmer, the rope becomes weaker.

5. **Cause and Effect:** Cause and effect explains relationships. Why did my drill overload? What caused the problem? Can I take steps to prevent it from happening next time? Look for supports that explain relationships and the reasons they exist.

Example:

Flattening the cutting edge prevents the drill from biting into the material too rapidly and overloading the drill.

An understanding of cause and effect gives you the tools to explain a procedure, product or principle to a customer.

PART V
AN APPROACH TO READING

Know what you want

What you want from a reading affects how you approach it. If you know exactly what you need, you might go over the contents quickly until you come to the information you want. Then you should carefully examine the details concerning the topic.

You may need instructions about using a meter, an explanation of how moisture affects wires, or the details about a wiring schematic.

If you are reading for a specific reason, you look for information related to your aim and pay less attention to details that don't seem related. This is a logical and economical approach to reading for a purpose. Below are some suggestions for getting what you need from a reading, once you have located the relevant information:

- ◆ Make notes while you read, detailing the main points.
- ◆ Use your own words to repeat what you have read.
- ◆ Try stating the main idea.
- ◆ Give the passage a title.
- ◆ Can you tell someone else what the passage is about in a few words? If you can, you've identified the main idea.

To understand a passage, you need to know its main idea and its details. You should be able to say, “This tells me the difference between two types of wire” or, “This explains why the joint failed.” If you can't, you know you need to reread the passage to find the main idea. Then look again at what supports do: They relate to the main idea but they also add details to our understanding.

Troubleshooting the System (Getting lost - and found again)

You think you have a clear sense of the main idea. You know what it's about. But, as you get further into this technical material, you start feeling lost.

Check:

- *Maybe you weren't on the main trail at all.* If the sentences don't seem on topic, rethink the main idea.
- *Maybe the paragraph doesn't have a clear topic sentence.* You can still find the main idea by looking at what all the sentences are about. Try to identify one word or phrase that seems to be the theme of the paragraph and develop the main idea from this.
- *Maybe, you're on the main trail but have strayed a little bit off it.* Again, this will send you back to the beginning. As you go back through the sentences, you may find a confusing part and realize, "Here's the spot that baffles me." You can identify the main idea, but a sentence or area of a chart contains details that you don't understand.

If you get the main idea but need to clarify some of the details, the first step is to identify the problem. It may be new vocabulary or words used in unfamiliar ways, technical terminology, or a math formula.

Begin to solve the problem:

1. Can you look up the new words?
2. Can you find a technical definition?
3. Should you get extra help with the math?

Sometimes a writer assumes you know a concept or theory, and has left it out. This makes your job tough. You may need help from an instructor, a different textbook or another student. Remember, if you can find the problem, you can fix it.

Read aloud

If you are stumped by a passage, try reading it out loud. Sometimes you discover that you have been reading one word wrong the whole time. Reading aloud may help you solve the puzzle. Sometimes, you can "hear" a problem better than you can "see" where a problem exists.

Complex passages

The main idea may jump out at you in short, familiar readings. In complex paragraphs with a lot of detail, math formulas and technical information, you may find the main idea buried. Read the section in pieces, ask questions as you go, underline and make notes. You might need to read parts of the passage several times to understand how the details relate to the main idea.

Application

Your test of understanding is the ability to explain something to someone else. Imagine you have to explain an estimate to a client. Where do you start? Start with the main idea.

1. **The main idea:**
 - It may be the difference between structural and cosmetic work.
 - You can give an overview and any problems you might expect.
2. **The supports** may include a variety of information. The details in the explanation depend how much your client wants to know:
 - Do they need all the details?
 - Can you show them plans or sketches?
 - Do they need to know the different material available, along with price?

Just as a writer chooses details to support the main idea and purpose, so do you. You can explain this – or anything else – by starting with the main idea and working through the details. You will use definitions, examples, comparison, and cause and effect details that relate to the situation. You will be practicing your skills and demonstrating your expertise.

CONCLUSION

As you read ask yourself, "What is this about?" If you can answer the question, you understand the main idea. If you can't answer it, go back and follow the steps to identify the main idea.

Build your skills from the base up. As you move to more difficult concepts, either in reading or in the complexity of a job, the skill of separating the main idea from the details still holds. The goal will remain the same: understanding the main task and all the details necessary to get you to a successful completion.

Work to understand how the details relate to the main idea. This may take longer, but if as a result, you get the effects you want, the time is well spent. When you understand the purpose of a passage, you find what you need, and, most importantly, find what you are supposed to learn.

Summary

1. **Notice how your trade/technical material is organized.** Do a visual check of the passage for length, for highlighted information and diagrams. Look for the patterns.
2. **Focus on the main idea before you start.** Identify the main idea through the title, the topic sentence, and find the supporting details that expand the main idea.
3. **Use the supporting details** to help you sort out the main idea. The supporting details answer questions such as how, what, why, where, when, and in what order.

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4. **Understand the types of details** found in technical writing. The supporting details give examples, order (sequence) of steps or ideas, definitions, comparisons and contrasts, and causes and effects.
 5. **Use an organized approach** to reading. Understand why you are reading so that you focus on the details you need. Make sure you also find what you are required to learn.
 6. **Translate what you have read into your own words** as though you were explaining it to someone else. Work from the main idea through to the details.
 7. **If you get lost, stop.** Find out where you got lost and try to identify the problem: Is it main idea, technical vocabulary, a math formula?
 8. **Accept that picking out supports to the main idea and listing information takes longer than just reading.** The results – identifying, finding and understanding the information you read – are essential to your trade success.

ANSWER PAGE

PART II Passage 1, Refrigerants

1. The main idea in paragraph one is that different refrigerants each require specific handling methods. – *There are several different kinds of refrigerants and each has its own specific handling methods.*
2. a) Paragraph two is about **why** handling techniques are important – *it is irritating to eyes and lungs and, can cause frostbite.*
b) The paragraph includes details about what protective gear is required how to deal with any accidents – *immediately refer to a doctor.*
c) Paragraph three is about safe storage and handling of refrigerants. The details stress the importance of containers and their capacity, the importance of keeping different refrigerants separate and the importance of temperature control. Paragraph three also introduces a new phrase: **hydrostatic pressure** and, because it can cause a serious problem, it is important to either know or find out what it means.

PART III Passage 2 and Passage 3, Topic Sentences

from Passage 2:

1. What is the main idea?
b) oxides of metals

from Passage 3:

1. What is the main idea?
c) how oxides determine metal characteristics.