

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

**COMMUNICATIONS SKILLS
STRUCTURE RECOGNITION**

**AN ACADEMIC SKILLS MANUAL
for**

The Construction Trades (Structures)

This trade group includes the following trades:
Drywall & Acoustical Applicator, General Carpenter,
Mason (Brick & Stone and Restoration), Reinforcing Rod Worker, Roofer,
Terrazzo, Tile & Marble Mechanic

*Workplace Support Services Branch
Ontario Ministry of Training, Colleges and Universities*

Revised 2011

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

STRUCTURE RECOGNITION

*An academic skill required for the study of the
Construction Trades (Structures)*

INTRODUCTION

You are on a job site looking at a freshly hardened foundation that is ready for walls. You need to know how far apart to place the studs before you can start framing. If you look for the information in the wrong place, you waste a lot of time and are frustrated by the process. But if you choose an appropriate method to find information, together with selecting the right guides, you can get to what you need efficiently and quickly.

Structure recognition means knowing where to look for information. Developing the skill of structure recognition as part of your reading skills helps you locate the right information quickly. It saves time and energy wasted searching through inappropriate material.

In this unit, we look at structure recognition to understand the following:

- ◆ The organization of technical material.
- ◆ How guides direct you to information.
- ◆ How to apply structure recognition.

PART I

ORGANIZATION OF TECHNICAL MATERIAL

Textbooks and manuals are organized in a logical way so that you know what's in them and where to look for information you need. If you understand the pattern of organization of your texts and manuals, you can make your search for information easier:

- ◆ Information is placed where it fits.
- ◆ It is labeled with chapter titles and headings.
- ◆ There is a consistent pattern that the text or manual follows.
- ◆ The main idea and details are presented in a logical sequence.

Organization: Textbooks and Manuals

You will know from a textbook title if the text is likely to be relevant to your trade. Once you have a text that covers the topics that you want to learn about, look at how it is organized. Information in trade material is organized into themes or topics. Each topic is divided into smaller and smaller units. You'll see a variety of ways for gathering and grouping information.

In a trade manual about occupational health and safety, you might see information divided into topics like the ones below.

PART I – PROCEDURES
PART II – EQUIPMENT
PART III – HAZARDS

Under each of Parts I to III above, you will find trade-related information about that topic. Each topic can also be divided into smaller sections, sub-sections or chapters.

Example: Part III could be divided into topics such as these:

PART III - HAZARDS
1. Electrical
2. Confined Spaces
3. Asbestos

You might also see information divided by the level of difficulty, covering information about a construction topic from basic through to advanced.

Example:
UNIT 1-12 – FUNDAMENTALS
UNIT 13-20 – INTERMEDIATE

Large topics are separated into smaller divisions and sub-divisions.

Example:
Tools & Safety

Unit 1	General Purpose Tools & Safety
Unit 2	Power Tools
Unit 3	Leveling Instruments
Unit 4	Review Questions

All of the information relates to tools. As you read from the top down, you can see what is covered in each unit.

General purpose, Tools & safety – chapter heading: provides an overview and general information about the chapter
Power Tools – one aspect of the broad topic
Leveling Instruments – a second aspect of the broad topic
Review Questions – questions about all the aspects of tools and safety covered in this chapter.

You can see that the information starts with a broad, general, topic and works toward narrower, more specific, topics. You can also see what you are expected to learn in these units. In student manuals, you often find questions at the end of each unit or chapter. Use them to provide direction to your review of the chapter material. After your review, use the questions to test what you have learned.

Become familiar with your textbooks and manuals by flipping through them. You will see the individual parts and the organization behind them. The more comfortable you become with structure recognition, the more quickly you will get the information you need.

PART II **GUIDES TO INFORMATION**

To help you find what you want, we will look at six of the guides used in textbooks and manuals:

1. Table of Contents
2. Introduction
3. Summary
4. Glossary
5. Index
6. Appendix

1. Table of Contents

Every textbook lists the contents at the beginning of the book. The Table of Contents will help you become familiar with a new text, and it will help you find information faster.

Once you have previewed the Table of Contents, you have a good idea of what's in the book. It lists, by name, the sections and sub-sections, chapters and sub-chapters in the textbook; it also directs you to any additional material such as the index and appendix (more on these two later).

A **Table of Contents** shows you the following information:

- ◆ chapter titles with page numbers,
- ◆ the order of the contents,
- ◆ the kinds of information you will study,
- ◆ how long various sections are,
- ◆ what comes first, second or last, and,
- ◆ where you are now, where you are going and where you have been.

Use the Table of Contents

Textbooks vary in style and layout, in language and diagrams, but the Table of Contents gives you a clear overview of what inside. Here are two ways the same information might be listed:

Example:

CHAPTER 2	
Measurement Systems	10
Introduction: Objectives and Terms	
Measuring tapes: locating lines	
Leveling instruments: care of instruments, setting up and leveling	

Example:

CHAPTER 2

Measurement Systems	10
Introduction: Objectives and Terms	13
Measuring tapes: locating lines	13
Leveling instruments: care of instruments, setting up and leveling	15

The two lists have the same headings, but the second gives you page numbers and it's easier to find the topics. You can find the page faster and you can tell how many pages are dedicated to each topic. This will indicate how long you will need to spend studying a topic.

When you see the chapter and sub-chapter headings with page references you should know what's in the chapter. The same applies when you read the entire Table of Contents – you know pretty clearly what's in the book. This examination tells you if the manual will be useful, and what chapters will be most useful when you are looking for information.

Additional help

A Table of Contents may list the following sections which are commonly found in technical information texts.

- Preface and /or Introduction
- Summary (Synopsis)
- Glossary of trade terms
- Appendix
- Index

If you don't see them listed, flip through a few chapters of your textbook. See if any (or all) of the above are in each chapter of your textbook. More importantly, check out what's in each.

2. Introduction and/or preface

The introduction, or preface, sets out guidelines, standards and conditions that let you know what you are going to be studying. It is found at the beginning of a text or at the beginning of each chapter. It outlines the objective of the text and sets you on the right track.

An introduction tells you the purpose of the text and who it is designed for.

Example:

This text covers theory and practice designed for vocational and technical students. Each section includes guidelines for model customer service. This was added on the recommendation of instructors.

The introduction above also tells you why a section of good customer service was added. You know you are getting the benefit of feedback from people in the industry.

An introduction refers to the basic information which will be in the text. It may explain why the information was chosen for the text, why a specific part will be important to the reader, or why some information is not included.

Example:

This manual is for wood frame buildings according to the National Building Code of Canada, 20xx. It does not cover variations for different parts of the country. Use this with *Residential Standards* whose provisions must be met in NHA housing.

An introduction may also give you this kind of direction:

Example:

Basic techniques are explained in this chapter. Because these directions will not be repeated in each section, refer to this chapter on techniques when necessary.

The information above is clear. You will learn techniques in this chapter and then *it becomes a reference chapter*. You've been told where to find information and now it's up to you to refer to it.

An introductory note may be essential to your safety, and to the safety of co-workers and customers. You must follow up on it.

Example:

Remember, these cautions are general. Refer to a service manual for specialized and specific hazards!

These two examples have something in common. They tell you that specific standards or instructions are found in other sources and then they direct you to refer to them.

Take the time to look for and read the introductions. The introduction can help you successfully organize your approach to learning the material contained in the book. It may be general information, but it can contain essential, specific directions or set out conditions for success.

3. Summary (or synopsis)

The summary usually appears at the end of a chapter or section. It is brief outline, often in point form, of what the chapter has covered. It reviews the key points and the object of the reading. This is an excellent time for a self-test. If, at the end of the chapter, you can't remember key information or you can't recognize technical terms, review the necessary pages and test yourself again.

4. Glossary

A glossary is a mini-dictionary. It is an important section in a trade manual or text. In alphabetic order, it lists and defines trade and technical terms you need to master.

If the glossary is at the beginning of a chapter, you might review the words before you start reading. The review will tell you the terms you know and the ones you have to learn.

Always be careful to note when trade definitions are different from the way you understand a word.

Example: You may use the word “*header*” in a few different ways. The *glossary* defines it this way:

header: A structural wood member at right angles to a series of joists or rafters. It supports the load over an opening such as a window or door. See lintel.

Make sure you understand and remember these terms as they will be a part of your work. A method for testing a new word is to see if you can explain it to someone who is new to the trade, or, imagine explaining it to a customer. If you can explain it, you have likely understood it. If not, go back to the glossary for a review.

Some texts may list *key terms*, or *trade terms* without definitions. Look at the words listed and make sure you understand and learn each word as you encounter it. You can develop your own glossary to review the list of new terms.

The *glossary* definition for “*header*” described what it is. It also said, “*See lintel*”. Looking up the meaning of lintel will add to your understanding of the meaning of header.

Examples:

cripple jack (also cripple rafter): This rafter does not intersect the plate or the ridge. It terminates at each end at hip and valley rafters.

heat transmission co-efficient: The rate of heat transfer per hour per square foot of surface when a temperature difference of 1°F exists on the two sides of the surface.

I-beam: Steel beam with a cross section that resembles the capital letter I.

R-Value (resistance-value): A number that rates the efficiency of an insulating material. The higher the number, the greater the insulating value. See Table 2 in Appendix A to compare materials.

Glossaries vary from text to text but they offer a lot of information. Become familiar with the glossary in your texts and manuals. It is an important tool for learning the language of your trade.

5. Index

The index is an alphabetic list of the topics in a book, with their page numbers. It is positioned at the end of the book and is designed to direct you to information. The index you see where every reference to a topic or term can be found in the book. This may be the most useful section of any book you use.

Index entries are single words or a few words and include page numbers (see the index entry in the table below) so you can immediately turn to the page or pages that have information about the entry. Large topics are divided into smaller topics and have sub-headings. For large topics like “*foundations*” or “*wood*”, the list of index entries might go on for pages.

Index or Table of Contents?

Both the Table of Contents and the index direct you to information, but they are set up differently. Compare these index and Table of Contents entries:

Index entry on foundations	Table of Contents entry on foundations
Foundations, concrete block, 129-131 wood, 19, 23, 132 pressure treated, 23-24 inspection, 18-22 Foundations and floor plans, 135 Foundation systems, 122-126 Foundation walls, insulation, 145-147 Etc.	Chapter 2 Footings and Foundations Grading, building lines, excavation 117 Foundation systems 122 Footings and slabs 123 Forms 126 Concrete 129 Design and strength 130 Etc.

As you compare the two, you can see that the index gives you a main topic broken into divisions that are smaller than in the Table of Contents. This should save you time when looking for a page or for more information:

Example:

Codes, building, 58

Example:

Lifting (apparatuses) 20, 223,

Although entries do not give you details about what you will find on these pages, you do know the topics. To find out exactly what's there and how useful it will be for you, you have to turn to the exact page and read carefully.

If it's not in the index

If you can't find a word listed in the index, there may be no information or too little information to be listed. Or, the word may be listed as a sub-topic or sub-category.

Example: You need information about *design of old structures, and finding bearing walls* and find it under "*Remodeling*".

Suppose you didn't know to look under "*Remodeling*" for information on finding bearing walls. You might have to make an educated guess as to what general category the word belongs to and look there.

In some cases, **information is cross-referenced**. It is listed in two places under two different words. This increases your chances of locating the entry. By going to one entry to locate the information, you will eventually be directed to the correct place.

Example:

Asbestos was often used in houses for joint compound, pipe insulation, siding and floor tiles. It is dangerous if disturbed. Do not cut, sand or handle material that might contain asbestos. Refer to the Special Disposal Chart, Appendix C for disposal guidelines. Check the municipality for specifics on disposal.

Example:

See Appendix C, Table 1, for the effects of inhaling chemicals

Example:

For complete details on these effects, see Table 1 in Appendix C, page 514

Use the Guides

Become familiar with a new text, flip through it. Then find out what's in it by referring to the guides that list or explain the contents. Most of us do not intend to read everything in a book to find the piece we want. We may only want two or three pieces of information. The Table of Contents, Index and Appendix act as guides to help you retrieve information you need quickly and efficiently.

Remember

All of these guides help you with your search for information. When you need something, your progress slows down if you can't find it. These guides are tools to speed your search.

PART III
HOW TO APPLY STRUCTURE RECOGNITION

Know your purpose

When you set out to look for information, you know the purpose of your search and you know what you are going to do with that information. You might need any of the following:

- ◆ to understand a procedure such as supporting a floor when framing,
- ◆ to understand a principle such as the relationship between temperature, expansion and contraction,
- ◆ to follow the specifications of a safety code, and/or,
- ◆ to find a picture or diagram of a technique.

Structure recognition will answer these questions:

1. Where is the information I want?
2. How do I find it without a major search?
3. What is the best guide for what I want?

Different strokes

No book, manual or guide will fit every purpose. If you know the different purposes of different texts, you save yourself time tracking down information.

Examples:

If you need building codes for your city and province, look in municipal by-laws and up-to-date ministry guides published for that purpose.

For general information on safety procedures, look in an up-to-date textbook or manual.

For specific safety procedures, look in a provincial or association safety guide published for your trade, or look in a manufacturer's or a service manual.

If you need to learn about the chemistry of concrete, you will need a text or manual that is designed to teach this.

The title of the text is will give you a good idea if it has the information you need. But, take time to look at the Table of Contents and index to see what's in the text before you buy or borrow it. You may also want to scan through the introduction, preface, or a few summaries.

Skip the Table of Contents

Imagine tackling a job such as installing a floor without a floor plan and without planning each step. We've all done it when we think the job is easy or routine.

Example: You've been assigned a chapter for homework. It's an unfamiliar text, but because you know what the assignment is, you don't see the point of checking the Table of Contents.

You read the assigned chapter and do the review questions at the end. You are confident of your answers except for numbers 6 and 8. The chapter doesn't give the answers. You redo the two questions and get different answers the second time through. You feel annoyed and frustrated. The next day you find someone to go through the problems with you. Your friend doesn't know the answers, but he checks your text and finds this in the Table of Contents:

Answers to Review Questions with Explanations, page 156

Always check the Table of Contents. If you find what you want listed there, you will save yourself energy – and quickly find the right answers.

The Structure of a Passage

On a job site, construction follows a logical order based on sound construction practices. If work is performed out of order, the entire project will be delayed or unacceptable. Written descriptions or directions also follow a logical order. Recognizing logical structure helps you to anticipate steps, find details and organize.

Texts, charts, guides or long passages also have a logical structure. Chapter titles and subtitles, and titles of charts and diagrams act as signals what information you will find in it. Titles, subtitles, headings and topic sentences help us to find required information quickly.

Read Passage 1 with structure and order in mind and answer the questions that follow. The answers are at the end of this skills manual.

Passage 1
Replacement Windows

Many older windows are replaced with newer models to improve heating and cooling efficiency. A wide range of sizes and special trim members is available. When replacing windows, determine the size of the opening by removing the inside trim and measuring the rough opening.

Take out the old units by removing the inside stops and lifting out the lower sash. Counterbalances may have to be disconnected. Next take out parting stops and remove the upper sash. Pry off the outside casing and remove the sill and frame from the opening. It may be necessary to saw through the sill and frame to remove them. Carefully, clear all loose materials from the opening and measure accurately for thickness. Level and insert the new unit. Use shims to make adjustments for the new unit in the same manner as for new construction.

Questions:

1. Where in Passage 1 would you expect to find the statement below?

Trim members can be reused if they are carefully pried off and nails are pulled through from the back side.

- a. Paragraph one.
 - b. Paragraph two.
2. The last sentence in the passage states: “*Use shims to make adjustments for the new unit in the same manner as for new construction*”. Where would you probably find this information about new construction and installing windows?
- a) In another textbook.
 - b) In the index under **Windows, new construction**.
 - c) In a table covering **windows, new construction**.
 - d) Continue reading until you find it.
3. When replacing old windows, where might you expect to find specific details about installation, sizes and trim members available in newer models?

Review

Answer the following questions about Structure Recognition. **Answers are on the last page.**

Questions:

1. If you picked up a new text and wanted information on pattern drafting, which section would you check?
- a) glossary
 - b) Table of Contents
 - c) appendix
 - d) all of the above

-
2. Which of the following would you expect to find in the appendix?
 - a) a list of abbreviations used on sheet metal drawings
 - b) an explanation of corrosion
 - c) the correct method to layout a pattern

 3. Why is it important to understand how trade materials are organized?
 - a) This can be a model for organizing your own materials.
 - b) This can speed up your search for information.
 - c) You can assess the text for what you need.
 - d) All of the above.

 4. If you take the time to assess a textbook when you get it, you may save time in the long run.

T F

CONCLUSION

Structure recognition means understanding how technical materials are organized and how to use the structure as a guide. Books use different ways to organize material but usually the organization of a book is consistent, so **take time to look at the pattern**. The **Table of Contents, introduction, summary, glossary, index and appendix** are reading tools designed to help readers get essential information. Use them in a variety of ways – especially **before** you start reading and **while** reading to review and remind yourself of what is important.

Understanding the structure and guides to structure can yield good results: you will know how to use a textbook to get the most out of it – and how to find out if it's the right one for you. It will speed your search for information.

Summary

1. **Understand how your trade materials are organized.** They start with broad general topics and then divide these into specific, more detailed divisions.

2. **Use the following structure guides:**
 - Table of Contents
 - Introduction
 - Summary
 - Glossary
 - Index (Indices)
 - Appendix (Appendices)

3. **Read through the Table of Contents to get an overview** of what is in the textbook.

4. **Find and use the glossary** (or equivalent list of trade terms) to learn new trade vocabulary.

5. **Use the Index to look up a topic.** The index will give you the range of material covered and where to find it.
6. **Use the Appendix for additional, related material.** Know whether the information is essential or non-essential.
7. **Apply your understanding of structure to organize your own study materials.** Develop your own guide so that you can find what is important when you need it.

ANSWER PAGE

PART III Passage 1, Replacement Windows

1. Where in Passage 1 would you expect to find this statement? *Trim members can be reused if they are carefully pried off and nails are pulled through from the back side.*
 - a) Paragraph one.

The information on removing trim is in paragraph one, so the statement will logically fit in there.

2. The last sentence in Passage 1 states: “*Use shims to make adjustments for the new unit in the same manner as for new construction*”.
Where would you find this information about new construction and installing windows?
 - b) In the index, under **Windows, new construction**.

When a passage doesn't give the location of further information, the index will quickly direct you to the correct section. If the index doesn't have enough information, you may need to look elsewhere.

3. When replacing older windows, where might you expect to find specific details about installation, sizes and trim members available in newer models?

Manufacturers provide specific measurements, diagrams, details and sizes of trim and guarantee information. They cover correct handling, inspection and storage. *General* installation is usually in a good carpentry book.

Review

1. If you picked up a new text and wanted general information on erecting walls, which section would you check?
 - b) Table of Contents

The Table of Contents is best bet here. For a more specific topic, you would probably use the index.

2. The appendix will include the following:
 - a) tables for metric/imperial conversion

Usually you find tables and charts in an appendix. You might also find charts on such topics as safe bearing loads of ice. Explanations of topics (Answer b), or information about techniques (Answer c) would most likely be found in one of the chapters on these topics – not in the appendix.

-
3. Why is it important to understand how trade materials are organized?
d) All of the above.

When you understand how textbooks are organized, it's like understanding how your shop is organized. If it begins to make sense, it makes your job easier, for all of the reasons above.

4. If you take the time to assess a textbook when you get it, you may save time in the long run.
- T** When you take the time up front to understand something, you often save in the long run. Understanding what you require before you start a section or a project helps you can accurately assess your needs, whether it means bringing the right tools and equipment, or thinking through a procedure before you plunge in. Starting right may take more prep time, but it will save you time once you begin the work and produce correct results.