

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

**COMMUNICATIONS SKILLS  
STRUCTURE RECOGNITION**

**AN ACADEMIC SKILLS MANUAL  
for  
The Horticulture Trades**

This trade group includes the following trades:  
Arborist, and  
Horticulturist

*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.**

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# COMMUNICATIONS SKILLS

## STRUCTURE RECOGNITION

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*An academic skill required for the study of the  
Horticulture Trades*

### **INTRODUCTION**

If you look in the wrong places for information, you waste a lot of time and are frustrated by the process. If you use a method and the right guides as part of your technical reading tools, you get what you need efficiently and quickly.

*Structure recognition means knowing where to look for information.* It means knowing which guides to use to find what you want. Apply this idea to your service manuals, textbooks and handouts. When you can find information quickly, it saves you time; more importantly, it means you use the right information to perform a task.

Practical applications of recognizing the structure of printed material includes such tasks as locating relevant information in textbooks, technical manuals, code books, safety regulations, Material Safety Data Sheets, and using on-line-help and diagnostic software to locate trade-specific information.

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**

#### ***THE ORGANIZATION OF TECHNICAL MATERIAL***

Textbooks and manuals are organized so you know what is in them and can find what you want. If you understand the pattern of organization in your printed materials, 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.

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Information in trade material is organized into themes or topics. Each topic is divided into smaller and smaller units. You will 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.

**Example:**

**PART I - PROCEDURES**  
**PART II - EQUIPMENT**  
**PART III - HAZARDS**  
**PART IV - TRADE SPECIFICS**

Under each of the Parts (I-IV above), you will find trade-related information about that topic; each topic will 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. Pesticide Precautions and Regulations**  
**2. Toxicity, Confined Spaces and Application**

You will also see information divided by the level of difficulty, from basic through advanced. Each unit will depend on and build from the information in the one before it.

**Example:**

**UNIT 1-12 FUNDAMENTALS**  
**UNIT 13-20 INTERMEDIATE**

Under headings such as those above, you will find information about topics grouped by trade, by level and by the steps of learning.

Large topics are separated into more specific divisions and sub-divisions.

**Organic Matter**

Unit 1 Organic Matter  
Unit 2 The Function of Organic Matter in Soil  
Unit 3 Maintaining Organic Matter  
Unit 4 Nitrogen Tie-Up and Composting

You can see that the information starts with a broad, general, topic (organic matter) and works toward narrower, more specific topics. You can also see what you are expected to learn in this unit. In student manuals, you often find questions or activities at the end of a unit (or chapter). These questions test what you have learned and let you review new material. Make use of them.

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.

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## **PART II**

### **GUIDES DIRECT YOU 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. The Table of Contents**

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

When you read the Table of Contents, you can see what's ahead of you. 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 about these 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 the contents. Here are two ways of listing the same information in a Table of Contents.

##### **Example 1:**

|   |    |
|---|----|
| <b>CHAPTER 2</b>                                |    |
| <b>Cultural Practices and Turfgrass Quality</b> | 10 |
| Introduction: How practices are connected       |    |
| Practices: Mowing, Fertilizing and Irrigation   |    |
| Questions and Answers                           |    |

##### **Example 2:**

|   |    |
|---|----|
| <b>CHAPTER 2</b>                                |    |
| <b>Cultural Practices and Turfgrass Quality</b> | 10 |
| Introduction: How practices are connected       | 10 |
| Practices : Mowing                              | 12 |
| Fertilizing                                     | 22 |
| Irrigation                                      | 39 |
| Questions and Answers                           | 45 |

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The two lists have the same headings, but the second gives you page numbers so it's easier to find the topics. You can find the page faster and you can tell how many pages are given to each of these topics. This will indicate how long you will need to spend examining 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 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 that 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 for turfgrass science and management. It is designed as a training and reference for students, apprentices and professionals. The basic principles fundamental to this trade will remain the same although the tools and technology will continue to change.

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 certain information is not present.

#### **Example:**

This book introduces you to the fundamentals of compression engine theory. It is designed as a training and reference for students, apprentices and professionals. The basic principles fundamental to this trade will remain the same although the tools and technology will continue to change.

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An introduction may also give you this kind of direction:

**Example:**

The definitions for toxicity and regulations for pesticides are explained in this chapter. Because this information will not be repeated in each chapter, refer to this 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 that of co-workers and customers. You must follow up on it.

**Example:**

**Remember**, cautions for handling these products are general. You must refer to a service manual for specialized and specific hazards!

The last two examples each tell you where to find instructions and to refer to them when appropriate. Your reading challenge is to develop a technique to remember where to find these directions when you need them. Maybe this is a place to put a tab or sticky note in the textbook; you might try a Table of Contents in your own notebook with page numbers for these special directions.

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 a brief outline, often in point form, of what the chapter 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 information or key technical terms, review the necessary pages and test yourself again.

### **4. Glossary**

*A glossary is a mini-dictionary.* It is an important section in every 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 these words before you start reading. This 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 understand and use the word *crown* but you have to learn the trade definition. The glossary defines it this way:

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crown: A highly compressed stem located at the base of a vegetative aerial shoot.

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 *crown*, above, described what it is and what it does. A glossary may also include an abbreviation or chemical formula ( $\text{Fe}_2\text{O}_3$ ) or give an abbreviation in full; it may give an alternate word (*rust* or "*ferric oxide*" are examples), or a guide to look under another word.

Here are some examples:

**Examples:**

aerify: See cultivation.

mulch blower: A machine that uses forced air to distribute particles of mulch over newly seeded turf. Developed for highway use, it can shred and blow baled straw onto the seedbed.

Pure Live Seed (PLS): Percentage of the content of seed lot that is pure and viable.

slit trench drain: A narrow trench (usually 5 to 10cm wide) backfilled to the surface with a porous material such as sand, gravel or crushed rock. It is used to intercept surface or lateral subsurface drainage water.

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 lets 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 "*steel*" the list of index entries might go on for pages.

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### 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 for Spark Plugs  | Table of Contents Entry for Spark Plugs   |
|--|---|
| Spark plugs, 116-120, 162-166, 234, 256, 312, 335<br>analysis of used, 118<br>chain saw, 162<br>cleaning, 118<br>gap, 118<br>gapping, 118, 119<br>Etc. | Chapter 12 <b>Ignition System Service</b><br>Spark Plugs 116<br>Removal 117<br>Analysing Used 118<br>Cleaning and Gapping 118<br>Installing 120<br>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:

#### Examples:

Cells, growth, 58

Fungi, diseases caused by, 34

Seeding, timing of, 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 will have to turn to the page and read.

#### 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 to be listed. Or, the word may be listed as a sub-topic or sub-category.

**Example:** You need information about *turfgrasses for fairways*. You looked under *turfgrass* and then *fairways* but did not find the topic you want. If you are stuck, ask for help from an instructor or classmate. It is important that you "crack the code" to gain access to the same information as everyone else.

Sometimes information is cross-referenced. This means it is listed in two places under two different words. The entry may tell you where else to look: *See also Measuring*, instruments or *See Settings*. If you are stumped, ask someone for help. If you do get stuck, try to understand the pattern used in the index so you can find what you need next time.

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Occasionally, the book uses a different term from yours, or it may list an item such as drills or punches under a category: *equipment*. There is still a logical order but, once again, you may need help to find the information. Usually, as you become familiar with a text or manual, you learn to “speak the same language” and finding information becomes easier.

### **6. The Appendix**

The **Appendix** is a section used for additional information. It is usually, but not always, listed in the Table of Contents. It is usually, but not always, placed at the end of a text or manual; in some cases, it is at the end of a chapter. You may find it listed in this way:

Appendices 567

Or, you may find each appendix listed in this way:

Appendix A: Tables 567-569  
Appendix B: Industry Standards 572  
Appendix C: Chemicals: Handling and Storage 574

The appendix offers more detailed explanations, evidence or background about a topic discussed in the text. In the appendix, you will find a variety of trade information such as:

- lists of symbols,
- lists of abbreviations and trade terms,
- tables of equivalents (metric to decimal),
- torque specifications for fasteners,
- graphs, detailed calculations, and
- Etc.

Appendices are placed at the end of the textbook for several reasons:

- ◆ so you are not distracted from the main information in a chapter,
- ◆ so you won't be slowed down by formulas when you read about a procedure or detail, and/or,
- ◆ to provide complete details on a single topic in one place or on one page.

The text will give you detailed explanations and instructions related to your trade. It will send you to the appendix to find related, useful and/or essential additional details.

#### **Example:**

For complete details on these standards, see Table 8 in Appendix I, page 570.

When appropriate, the text will refer you to this table again. You may also be directed to find information in this way:

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

### **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,
- ◆ to understand a principle such as the relationship between temperature and expansion or contraction,
- ◆ to follow a safety code, and/or
- ◆ a demonstration (pictures or diagrams) 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:**

For general information about 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 the chemical structure of herbicides, you will need a text or manual that is designed to teach this.

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The title of the text will give you a good idea if it has the information you need. 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 disassembling a chainsaw without keeping track of the parts. Imagine tackling any other job without a system. We've all done it.

**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. The answers might not be listed there, but if they are, you'll save yourself some energy - and quickly get the right answers.

### **The Structure of a Passage**

On a job site, or in the shop, work follows a logical order based on the practices of small motor service. If work is performed out of order, the entire job 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 order in mind and answer the questions which follow. The answers are at the end of this skills manual.**

#### **Passage 1**

##### **The Carbon Cycle**

Two processes occur during photosynthesis which all life depends on. First, carbon dioxide in the air is changed to organic carbon which is the building block of living tissue. Second, photosynthesis converts the energy from sunlight to chemical energy which is stored in simple sugar.

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Plants contain chlorophyll which is necessary for photosynthesis. The carbon cycle begins when plants convert carbon dioxide in the air to plant tissue. The *food chain* is made up of plants, called *primary producers* as they are the basic food for animals, animals that harvest the plants, called *primary consumers*, and animals of prey, called *secondary consumers*. To complete the carbon cycle, certain microorganisms aid in the decomposition of plant and animal bodies. During decay, most of the carbon is changed to carbon dioxide which closes the carbon cycle. Some carbon is also recycled by plant and animal respiration.

Organisms which aid decay break down organic matter such as leaves and dead animals. As a result of decay, plant nutrients are released that would otherwise be tied up.

**Questions:**

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

*Plants and animals "burn" the sugar or use the energy during respiration.*

- a) The last sentence in paragraph one.
  - b) The fifth sentence in paragraph two.
2. The last sentence in paragraph three states:  
“... *plant nutrients are released that would otherwise be tied up*”.

Where would you find more information about plant nutrients and the carbon cycle?

- a) You will need another textbook for this.
- b) You should continue reading until you find it.
- c) You should look in the index under **Plants, nutrients**.
- d) You should look in the appendix for a chart or list of plant nutrients.

**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 soil texture, which section would you check?
- a) glossary
  - b) Table of Contents
  - c) appendix
  - d) all of the above
2. The appendix will include the following:
- a) tables for metric/imperial conversion
  - b) an explanation of soil pH
  - c) a comparison of tillage systems

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3. Why is it important to understand how trade materials are organized?
    - a) It can be a model for organizing your own materials.
    - b) It 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. It also means you know how to use the standard set of guides. Understanding the structure and the guides can yield good results: You will know how to examine a textbook to get the most out of it - and how to find out if it's right for you. It will speed your search for information.

Become familiar with your books and manuals by flipping through them. You will see the individual parts and the organization behind them. The more you do this, the more comfortable you will become with your reading materials, and the better you will be at using them to get the information you need.

### **Summary**

1. **Understand how your trade materials are organized:** by topic from broad general information to specific, more detailed divisions.
  
2. **Use the system of guides provided:**
  - a. Table of Contents
  - b. Index (Indices)
  - c. Appendix
  - d. Summary,
  - e. Glossary, and
  - f. Introduction/Preface
  
3. **Read the Table of Contents** to find out what is in the textbook. It's a bird's eye view of the material in this text.
  
4. **Find and use the glossary** (or equivalent list of trade terms) **to learn new trade words.**
  
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.** Be sure that you know whether information is essential or non-essential.

7. **Apply your understanding of structure to organize your own materials.** Develop your own guide so that you can find what is important when you need it.
  
8. **Know where to look and know how to use a system to gain control over your studies.** You will have access to the information and the answers you need to get on with your job.

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## ANSWER PAGE

### **PART III Passage 1, The Carbon Cycle**

1. Where in Passage 1 would you expect to find the statement below?  
*Plants and animals “burn” the sugar or use the energy during respiration.*
  - a) The last sentence in paragraph one.

This sentence relates to the sentence that comes immediately before it: ... *photosynthesis converts the energy from sunlight to chemical energy ... stored in simple sugar.* It states who uses the simple sugar and how they use it. It is not part of information about decay and the carbon cycle, so would it not be in paragraph two.

2. The last sentence in paragraph three states: “... *plant nutrients are released that would otherwise be tied up*”.  
Where would you find more information about plant nutrients and the carbon cycle?
  - c) You should look in the index under Plants, nutrients.

It is likely that either Answer a), Answer b), or Answer d) would eventually get you the information you need but, you will save time if you just go to the index, Answer c), and find out exactly where the information is. Information about plant nutrients related to the carbon cycle should be in the same textbook, likely, and close to this passage on the carbon cycle. A chart or table may be in the appendix (Answer d), but it is just as likely to be in a chapter on this topic.

### **PART III Review**

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

The best bet here is to check the Table of Contents because most texts would include a unit, section or chapter on soil. The topic of texture would be in the chapter. The index would also help though it will list all the pages on soil related to every topic.

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

Usually you find this type of table or chart in an appendix. You might also find charts with lists of common/chemical names of pesticides, or math formulae. Explanations such as soil pH (Answer b), or comparisons of methods (Answer c) are likely found in a chapter on the topic – not in the appendix.

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

There's no good reason *not* to understand the organization. When you understand how trade textbooks are organized, it's like understanding how your business or tool shed 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 the whole thing means you can assess accurately, bring the right tools and equipment, and think through a test procedure before you plunge in. Doing the right thing may take more preparation time, but it will produce the right results.