

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

**COMMUNICATIONS SKILLS
INTERPRETATION OF DIAGRAMS**

**AN ACADEMIC SKILLS MANUAL
for
The Hairstylist Trade**

*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

INTERPRETATION OF DIAGRAMS

*An academic skill required for the study of the
Hairstylist Trade*

INTRODUCTION

You've probably heard this expression: "A picture is worth a thousand words." It means that something you can see would take a thousand words to explain. The purpose of graphic material (diagrams, charts, pictures) is to make information about your trade easy to see. The correct *interpretation of diagrams* is necessary in order for you to benefit from the information they contain.

The information in a diagram might illustrate a new concept, show the correct order of the steps of a procedure, or provide the requirements and tools for a job. You need to be capable of interpreting drawings to verify the correct placement of different applications. Clearly, *interpretations of diagrams* skills are essential for your technical reading toolbox.

Diagrams can provide details about areas that you can't easily see. Other graphics such as charts and tables list details such as measurements in a way that makes it easy to find the correct component needed for a specific situation. Pictures can give you an idea of the result, or they can show differences in related items.

Interpreting graphics correctly is an essential skill to develop as you master the knowledge and techniques of your trade. In this skill sheet, we will look at:

- ◆ Standard symbols and diagrams
- ◆ Symbols and diagrams as visual language
- ◆ Diagram and text that interpret information
- ◆ Information in text and diagrams that match

Graphics

The term *graphics* refers to the various types of technical drawings and charts used in your trade. Graphics are a means of communicating complex ideas in a small space. They serve many purposes: they illustrate concepts, show relationships, compare information and illustrate how something works, how to do something, or where something is.

Symbols

As you learn your trade, you will be introduced to many symbols. Symbols are a shortened form of language. An object, process, relationship or number can be converted into a symbol. Many symbols are international. When you come across a symbol in your reading or on the job, you need to learn what term the symbol stands for and you also need to know what that term means.

Example: These three international symbols demonstrate this:

x	multiplication symbol	Multiplication is indicated by the symbol x . The x symbol immediately identifies a process. It also tells you what to do.
CO ₂	carbon dioxide symbol	The relationship between a carbon molecule and an oxygen molecule can be stated symbolically. The symbol CO₂ stands for or represents carbon dioxide. The C stands for a carbon molecule; the O stands for an oxygen molecule; the ₂ tells you there are two oxygen molecules. Glance back over this explanation on CO₂ . "A symbol is worth a thousand words".
M	number symbol for million	Many numerical amounts are represented by symbols. M is the first letter of the Greek word mega (great) and it is used to represent the number million.

Symbols in text

Symbols are routinely used in technical writing and in drawings.

Example: The purpose of the paragraph below is to pass along specific information about an aspect of your trade – *physical properties of matter*:

The formula for density is as follows:

$$D = W \div V$$

What is the density of 1 cubic ft of water (weighs 62.4 lbs)?

Your ability to find the solution depends on your understanding of the meaning of symbols such as D, W, V, ft and lbs. If symbols used in text or diagrams are unclear, you need to look them up. We have listed the meanings of these symbols below:

D = symbol for density.

W = symbol for weight

V = symbol for volume.

ft = symbol for feet. One foot is equal to 0.3048 metres.

lbs = symbol for pounds. One pound is equal to 2.22 kilograms.

As you learn your trade, you will encounter many symbols – some will be familiar and others will be new. It is your job to learn what they mean to add to your understanding of the concepts, principles, and “language” of your trade.

Purpose

Your purpose in learning symbols is to learn to read and speak the language of your trade.

You need to interpret both written material *and* any graphic material found in the text to understand and use the information presented.

PART II

SYMBOLS AND DIAGRAMS AS VISUAL LANGUAGE

Once you learn the meanings of trade symbols, you can recognize their meaning when you come across them in later sentences. This is the next sentence in the paragraph about physical properties of matter.

Example: Water has a density (D) of 62.4 lbs per cubic ft (V).

You already know the meaning of the symbols so you can figure out what the sentence is saying.

Lines and shapes mean something

Lines and shapes used in technical drawings represent something real so they can show you how to do something, what something looks like, or things that you can't see such as the root of a hair shaft. Labels on lines and shapes will explain what they represent.

Road maps

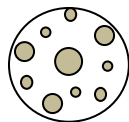
A diagram is like a road map. A road map gives you an overview of a whole system: compass directions, routes, distances, names of places. From it, you can calculate distance and travelling time, determine stopping points, plan routes. A figure with each of its symbols is like a map to use as a guide to essential trade information.

PART III

DIAGRAMS AND TEXT WHICH INTERPRET INFORMATION

Diagrams

Diagrams relate to something real. They show you how to do something or what something looks like. In some cases, the diagram looks like the real thing (such as the drawing of a tool); in other cases, it represents but does not look like the real thing such as this drawing of a specific texture of hair.



Fine Textured Hair

When you know that this drawing represents fine textured hair, the information it gives you will be clear and exact.

Figures

When you are reading, you might be directed to a graphic, which is usually labeled as a Figure with a number. The reference to the graphic may be in parentheses like this (Figure 2-10). Or, the text may tell what the graphic will show you.

Example: The French braid being displayed in Figures 2-10 through 2-15, is the invisible braid. This braid is performed by overlapping the strands on top.

Read everything

Knowing the purpose of a graphic helps you interpret what is being conveyed. It's important to get all the information available from a graphic. The information is there to help you develop a clear understanding of the principles and concepts required by your trade.

Labels and headings

Headings, titles and labels add to the information available in diagrams and help you interpret what the information is telling you. Be sure to read all titles and headings. The labels or descriptions in a diagram identify what you are looking at; they may contain directions or point you to an important aspect of the diagram.

Use all the information provided by labels and written descriptions within the diagram to get the complete picture.

To interpret a diagram, start by reading the label. A label offers important information. It may

- ◆ identify the diagram,
- ◆ describe how to follow the information on the diagram,
- ◆ refer you to the text for clarification,
- ◆ highlight important points.

Diagram labels provide a focus for the information presented. Here are some samples of labels attached to diagrams. Each label gives more information than the one before it and each label relates to the graphic *and* text.

Figure 1 An electric thermal iron.

Figure 2 Testing the heat of an electric thermal iron.

Figure 3 Making a Spiral Curl with an electric thermal iron.

Using Text and Diagram Together

Figure 4 provides key information about how shampoos clean the hair. The text and diagram are important and useful on their own, but together, they give a more complete picture.

The text explains how shampoo cleans the hair. The diagram shows exactly what the text means. The diagram is labeled so you can identify various parts. It is simplified: you get enough information to see the process but not so much that it distracts you from understanding the key details. Also note the information added with symbols: the direction of movement of water (arrows) and the shampoo (lines with the rounded head).

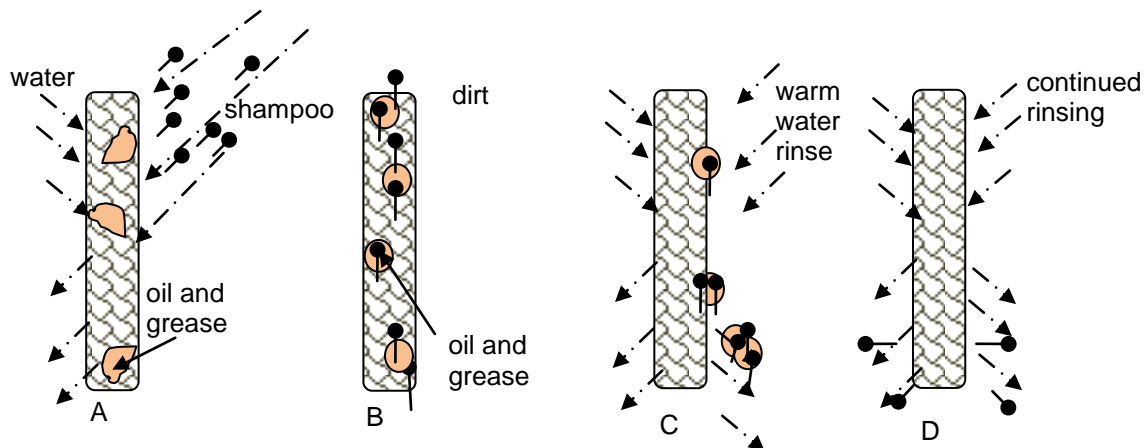


FIGURE 4: Action of Surfactants in Shampoos

A surfactant molecule has two ends. During shampooing, the hydrophilic end attracts water and the lipophilic end attracts oil. This creates a push pull process, causing oils, dirt and deposits to roll up into little balls which can be lifted off by the water and rinsed from the hair.

- 4A shows the tail of the shampoo molecules attracted to the hair, grease and dirt.
- 4B shows that as it attaches itself, the shampoo causes the grease and oils to roll up into small globules.
- 4C shows that, during rinsing the shampoo heads attach to water molecules and cause debris to roll off.
- 4D shows how a thorough rinsing will ensure debris and excess shampoo are washed away.

The diagram aids your understanding of how shampoo actually works. You can "see":

- hair,
- oil, grease and dirt;
- water (dotted arrows); and
- shampoo (lines with the rounded head).

The text provides explanations and directions not found in the diagram. The diagram shows where and how something happens. The diagram and the text differ; yet, **they work together** to describe an important process, to give reasons for it and to provide a mental and visual picture.

When you have read and understood both the graphic and the text, you can understand:

- what happens as the shampoo is introduced to the environment,
- what this does when it attaches to the oil and grease,
- the way the globules are formed, and
- the role of rinsing in the process.

You can also:

1. Name the two ends of a surfactant molecule.
2. Explain the *push-pull* process and how shampoo works with water to remove debris from the hair.

If you can answer the above questions, you have correctly interpreted the information.

How not to . . .

Technical drawings often show you how to do something. The text describes the actions to be done and explains the reasons for doing them, while the drawings show how to perform those actions. Examining both text and drawings helps you accurately follow directions and avoid problems.

In the next example, the text describes how to how to interpret the results of preliminary test curls while the graphic illustrates the desired result as well as two unwanted results.

Passage 2 Preliminary Test Curls

When judging test curls, remember that different hair textures with varying degrees of elasticity will have slightly different “S” formations. The figures in diagram 5 below, illustrate possible outcomes of a curl test. The desired curl is shown in figure 5A. Overprocessing of the hair (figure 5B) causes frizziness, dryness or hair damage. This could occur for a few reasons: the lotion was left on too long, or was too strong, or the test curls were not made frequently enough. Underprocessed hair (as shown in figure 5C) is a result of insufficient processing time of the waving lotion. Underprocessed hair will have a limp wave formation. The ridges are not well defined and the hair retains little or no wave formation.

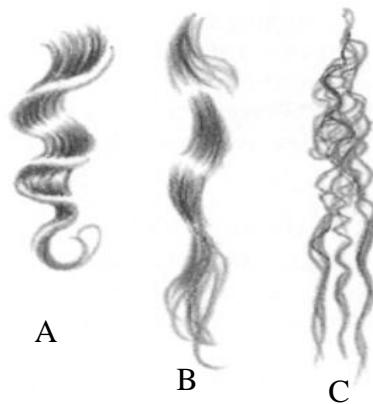


FIGURE 5: Results of Preliminary Test Curls

Read it all

When we look at diagrams, charts or tables, we need to refer back to *the guidance of the text*. The text tells us when to refer to the diagram and directs us to specific aspects of a drawing; it may repeat or emphasize important points.

The text on **Preliminary Test Curls** directs you to figure 5A in the fifth sentence and it directs your attention to a point on the diagram:

The desired curl is shown in figure 5A.

Make sure you find the corresponding spot on the diagram. It is illustrated so that you can see it and understand it. You need to be sure that you are seeing exactly what you are supposed to see.

The rest of the paragraph describes results you do not want and directs you to figures B and C so you can see those results:

- frizziness, dryness or hair damage – figure 5 B, and
- underprocessed hair – figure 5 C.

After comparing correct and incorrect results, you should be able to apply these directions. Further, the visual information should help you remember how to do this and why it's important to do it right.

Test yourself

Assess how well you are interpreting diagrams. If we removed the references to the figures in the text above (e.g. Figure 5A, B and C), could you do the following?

1. Match the text and diagrams correctly.
2. Show which is the desired curl and which is not.
3. Explain why. If it is not clear, read and then reread. Match diagram to text and text to diagram as you go. Find spots on the diagram the way you would pick out points on a map.
4. Compare the three diagrams and refer to the text.
5. Suggest possible reasons for the appearance of each curl.

PART IV ***INFORMATION IN TEXT AND DIAGRAMS***

Stop and read the diagram

A diagram relates to something real, whether it is a shampooing process or a symbol for fine textured hair. You need to be able to convert the information into language and later into actions. The first step is to understand what is being depicted by the diagram. Describe to yourself what the diagram represents. If you don't recognize certain symbols, look them up.

Read Passage 3 below and identify places or points on the graphic that correspond to the main text. The text explains a principle; the table converts the written explanation into a visual representation.

Passage 3 **Acidity and Alkalinity**

The pH of a solution is a chemical measure of its acidity or alkalinity. The pH scale ranges from zero to 14. Pure water is considered neutral and is represented by the number 7 in the middle of the scale. If a solution has a pH of less than 7, it has an acid pH. If a solution has a pH of more than 7, it has an alkaline pH. An alkaline solution softens and swells hair, while an acid solution will contract and harden the hair.

Metres and indicators (such as a nitrozone paper), are available to you in order to measure the pH of the products you use. The paper turns dark if the product is more alkaline. There will be little change in colour if the product is more acid. If you wet hair with water and test the pH balance, you will usually

CONCLUSION

The text that accompanies a diagram is directly related to it. They are partners. Usually the main text explains in words the information you see in a diagram. It also directs you at the appropriate time to study the diagram. It tells you what you should look for in the diagram.

When you use the information from both text and graphics, you develop a better understanding of a principle, a procedure or a type of equipment. Use text and diagrams together to enrich your learning. They can clearly show you a complex idea in a small space.

When the text describes steps in a process and the diagram illustrates it, you can follow the information flow. Your eyes can move in all directions. You can *see* the information from different points in the process. You can interpret what is happening at different stages.

Technical diagrams and symbols transfer information. Provided you read carefully and interpret correctly, graphics can do any of the following in little space and at a glance:

- ◆ show relationships.
- ◆ make abstract ideas easier to understand.
- ◆ show you something invisible or hidden
- ◆ focus on and emphasize important aspects on information.

Summary

1. **Symbols are a form of shorthand.** Understand what these symbols represent to understand the language of your trade. Note any differences between countries.
2. **Lines convey information.** Lines and symbols can show relationships, objects and processes.
3. **Diagrams (graphics) use a visual approach** to make technical information meaningful.
4. **Diagrams are clearly labeled** to identify parts and their relationships.
5. **The text and diagram are directly related to each other and work as partners.** Always use them together.
6. **Always read the description that accompanies each diagram.** They tell you what you are looking at and what to look for.
7. **Diagrams and symbols relate to something you need to know.** Interpret and connect them to achieve understanding.

Answer page

PART II Acidity and Alkalinity

1. Where would you place a shampoo on the pH scale?
c) between blood and soaps

To answer this question you need to read both the passage and diagram. The second paragraph says “*shampoos will normally have a pH of about 8.*” From here, you need to go to the diagram and find the pH value of 8. We see that blood is a little less than eight and that soaps are a little more than nine. Answer c) is the right choice.

2. Which of the following answers, most accurately represents the pH of Hydrogen Peroxide?
b) 4

Hydrogen peroxide is not mentioned in the passage, but it is in the diagram. Therefore, careful viewing of the diagram is necessary in order to pinpoint hydrogen peroxide and find its pH value. The correct answer is b) 4.

3. Ammonia is likely to turn a nitrozone paper dark.

T Again, you need to go to both text and diagram. The passage lets us know that we can measure the pH of a product with nitrozone paper and that if the product is more alkaline, it will turn the paper dark. Now we have to find Ammonia on the diagram. It has a pH of around 12 which is definitely more alkaline. We can assume, if tested, it would turn nitrozone paper dark. Therefore the answer is true.

4. Colour rinses are alkaline.

F The answer to this question is found in the same manner as the answer to question 3. The passage states that “*colour rinses have a pH of about 2.*” Referring to the diagram shows us that 2 is more acid. Therefore, the answer is false.