UNIT 16 BRAILLE READING AND WRITING

Structure

16.1 INTRODUCTION

Not being sighted and, therefore, not being able to see print, a different medium for reading and writing is needed for people with visual disabilities. This medium is based upon tactile (sense of touch) skills of the person and is called 'braille'. It is a system of communication developed by Louis Braille, after whom it has been named. It is a tactile approach (i.e. based on the sense of touch) to reading and writing for children with visual impairment, in which the letters are formed by combinations of raised dots in a cell. The child touches these dots on paper and 'reads' what is written. Similarly, she can write in braille by forming these dots on paper using special equipment.

In this Unit, you will read in detail about reading and writing braille.

Objectives

After studying this Unit, you will be able to:

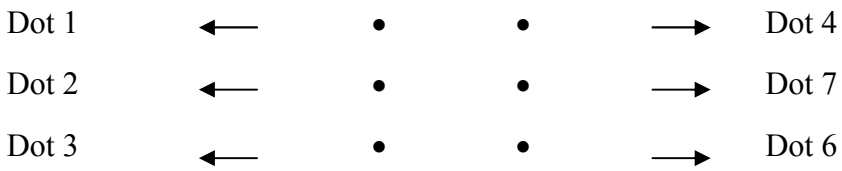
- explain the meaning and significance of readiness activities for learning braille;
- describe the hand and finger position for reading braille and the method of teaching reading of braille script; and
- state the method of teaching braille writing using slate and stylus as well as brailler.

16.2 BRAILLE READING

Braille reading and writing are important skills in the language development of persons with visual impairment. These skills help to bridge the communication gap caused by the absence of sight.

A braille cell consists of six dots, which can be arranged into different combinations. The different combinations stand for different letters and words.

A BRAILLE CELL



The braille system is classified as Grade 1, Grade II and Grade III level. In Grade 1, which is the basic level, each and every letter of the word is specified in braille. Thus, to write the word 'cat', the letters 'c', 'a', and 't' are written separately in braille. Grade 1 is sufficient for those who do not use braille for extensive reading. It may suffice if a person wants to write a letter in braille and is appropriate for adult blind people who need to learn to read and write for day-to-day living, but who do not need to read and write extensively.

Grade II represents the contracted form of braille. The prefixes, suffixes, pronouns, conjunctions and prepositions, are denoted by contractions. Thus, instead of writing 't', 'h' and 'e' separately to indicate the word 'the', there is a particular symbol which is written to denote 'the'. **Braille books prescribed for school children usually contain Grade II braille.**

Grade III braille is the complicated form of the Grade II Braille — it is like a shorthand system. Not many use it, because it is complex. Those persons, whose profession requires them to take notes and record the proceedings of meetings, learn the Grade III braille.

16.2.1 Pre-Reading/Readiness Activities for Learning Braille

Before the child can learn to use the tactile medium braille for reading and writing, she needs to develop a number of 'readiness skills'. 'Readiness skills', also referred to as 'pre-reading' and 'pre-writing' skills, refer to those skills which a person needs to acquire before she can learn to read and write braille. Some of these readiness skills are as follows:

- A well developed sense of touch so that the child can feel the small dots and recognize the different patterns, which represent different letters. This skill is also known as '**tactile discrimination'**.
- **Memory** to remember which combination of dots signifies which letter of the alphabet and to remember when and in what circumstances the contracted form of braille may be used.
- **Motivation to read and familiarity with books.**
- **Concepts of position and space** (such as left and right, top and bottom, above and below, inside and outside etc.) which are necessary to be able to read Braille.
- **Skilled movement of the hands** from the left to the right of the page in order to be able to read Braille.

- The ability to **associate the words** she is reading with real life objects, events, actions and situations.

Unless the child has these readiness skills, she will not be able to read braille. That is why the activities that you carry out with the child to develop these readiness skills are called pre-reading and pre-writing activities.

Let us now take a look at some of the readiness activities for learning braille.

Develop readiness (or pre-reading and pre-writing) skills in the child before introducing braille reading or braille writing.

a) Activities for tactile discrimination

Right from the preschool years, when the child is around 3 years of age, activities must be carried out with her to help her refine her sense of touch. All the activities to foster the sense of touch, about which you read in Unit 15 of the next Block 4, and the fine motor development activities about which you will read in detail in Unit 18 of the next Block 4, are useful for this.

Some examples of these activities are given here:

- Give the child a mixture of tiny items such as peas, rice, buttons, etc. and ask her to separate (sort) them.
- Let the child turn the pages of a book and count them.
- Ask the child to string beads, buttons or leaves and count them.

b) Activities to develop the motivation to read

Sighted children have newspapers, magazines, books, posters and slogans within their visual environment. Even though they may not be able to read them or know what they mean, the presence of these in the environment motivates the child to learn to read. They develop **print awareness**. But this will not be the case for the child with visual impairment. Her motivation to read needs to be developed. Reading stories from books to the child, singing rhymes, and reading news items from newspapers will motivate the child to learn to read. Also, the child will need help in associating words with actions, objects, and events which will help her to link the symbols of braille characters with spoken words. Thus, for example, the child would need to understand that the spoken word ‘run’ stands for the action of running; only then she would be able to connect ‘run’, written in braille, with the real life action of running.

c) Activities for developing concepts related to position and space

To use books, for basic language development and for general orientation to the environment, the children with visual impairment need to develop concept and ideas with regard to position and space (such as left and right, top and bottom, above and below, inside and outside etc.).

Concept of position and space is another 'readiness skill'. Sighted children develop these ideas during the course of their activities at the home and the school. The children with visual impairment, too, require play activities to help them develop these concepts through activities specially adapted to accommodate to the fact that the child cannot see. So the games designated to develop the concepts of position and space have to be based on hearing and touching. You have read about these in Unit 11. Thus, for example, to teach a child with visual impairment the concept of 'left' and 'right', you may hold her right hand, help her identify that is the hand with which she eats, and give her practice in showing her right/left hand when asked.

The children need to be able to identify not only the left and right of their own body parts, but the left and right of other persons as well. They also need to be able to identify things kept on the right/left and move to left and right when given instructions to do so. Organize games that require the child to locate the right and left of other persons and relate the same to her own body. You may encourage left-to-right movement of the hands by playing games and puzzles which involve following raised lines with the fingers from left to right.

d) Activities for familiarizing the child with books

Yet another readiness skill is the child's familiarity with books. Braille work is commonly in book form, consisting of sheets of paper which are the pages, as in any book for the sighted. So the child with visual impairment has to know

- What a book feels like
- The shape of a book
- The front and back of the book, so as to know from where to start reading the book and where to end
- The top and bottom of a book
- The left and right of the page, so as to know where 'to begin to read and write and where to end
- How to turn pages in a book
- How to identify the required page.

These readiness skills need to have been acquired by the child before braille is introduced, because without these basic skills, learning braille might prove very confusing for the child.

16.2.2 Hand and Finger Position in Braille Reading

Once the child has sufficient exposure to the readiness activities, you can introduce her to braille reading and writing.

The fingertips possess special nerve endings, which enable braille reading. The area covered by the light pressure of the fingertips on the paper gives the necessary information to the individual to discriminate between the different configurations of braille letters, which are typically written within a braille

cell, in the area of approximately 6 mm x 3.6 mm. For effective braille reading, the child needs to develop a proper braille mechanism. **Braille mechanism means the efficient movement of the hands over the braille line, with the proper hand and finger position.** Children who do not develop efficient braille mechanism just 'butterfly' (spread their fingers) over the braille sheets, which leads to slow reading of braille. To develop proper braille mechanism in the child, the child needs to be taught by a teacher who knows braille.

Let the child begin to read braille using both the forefingers. It is universally recommended to use both the forefingers for a beginner. The child should be encouraged to touch the dots lightly, which -involves upward and downward movement of the reading fingers. Do not allow the child to scrub the dots (i.e., to rub the dots), because then the dots lose their original shape. While the finger of the right hand moves through the braille line, the finger of the left hand should follow the right hand. Now when the right hand reaches the end of the line, the left hand following it should retrace theline, which the child has just read, go to its very end and then move downwards to identify the beginning of the next line. Thereafter, the right hand, which is at the right comer of the previous line, has to be brought to the position of the left hand in a diagonal manner, and the process continues.

16.2.3 Method of Teaching Braille Reading

The recommended method in teaching reading of braille is the 'sentence-word-letter' method. This is usually the method adopted for teaching reading to the sighted children as well. The sighted child is exposed to whole sentences in the beginning. So as to help the child know how a sentence looks like, the same strategy is followed in the teaching of braille. For example, begin by exposing the child to a short poem which will help her to discriminate the lines in terms of their length.

Baa baa black sheep

Have you any wool?

Yes Sir Yes Sir

Three bags full…

After sufficient practice in discriminating the lines in terms of their length, expose the child to words. You can use flash cards to develop skills in word discrimination. The following is a sample exercise is to help the child to discriminate the word 'Milk'.

Milk	Tree	Tree	Tree
Tree	Milk	Tree	Tree
Tree	Tree	Milk	Tree
Tree	Tree	Tree	Milk

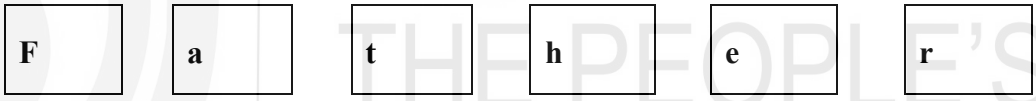
The word 'Milk' appears in different positions and the child learns to distinguish it from other words.

When the child is able to discriminate the lines and words of a familiar poem or a passage, she is ready for **word analysis and word synthesis skills**. 'Word analysis' means spelling out the words into individual letters and 'word synthesis' means grouping individual letters to form a word. Let us take a look at how you may teach these skills to the child.

Choose some words such as 'father', 'mother,' 'spoon' and 'home', that are familiar to the child. The words may be spelt out (analyzed) into letters in the following way:

father	f-a-t-h-e-r
mother	m-o-t-h-e-r
spoon	s-p-o-o-n
home	h-o-m-e

Use flash cards to teach word analysis and word synthesis skills in the following manner. Take a flash card and write the word 'father' on it. Use separate cards to represent each of the letters f, a, t, h, e, r. Teach the child to join these separate flash cards to form one word — 'father'. This kind of an activity helps the child to know how the letters of the words are separated and how they may be combined to form a word (word synthesis). Word synthesis is a challenge for the child because she has to not only learn that letters combine to form words, she also needs to learn that the letters of a particular word can be combined to form different words. The following example will make this clear.



Now, the different letters of the world 'father' can be combined to form new words, such as the following:

f-a-t	fat
h-e-r	her
t-h-e	the
s-a-t	sat
a-t	at

Thus, the flash cards are recombined differently to make different words.

Check Your Progress Exercise 1

1) What are the three levels of braille classification, and how does each level differ in terms of complexity and application?

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2) Describe the readiness skills necessary for a child to begin learning braille and provide examples of activities to develop these skills.

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3) Explain the method recommended for teaching braille reading and writing, including the role of the 'sentence-word-letter' approach.

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16.3 BRAILLE WRITING

Special appliances are needed to write braille. In our country, braille slate is commonly used for this purpose. Those who can afford a mechanical braille writer can buy it. However, it is costly and everybody cannot acquire this equipment. Let us first read about the braille slate and stylus.

16.3.1 Braille Slate and Stylus

The **slate and stylus** are tools or equipments used by persons with visual impairment to write Braille text, just like a pen or pencil is used by a person with vision to write a language. The pen or pencil is designed to write in a paper, and the slate and stylus is indented to punch (emboss) raised dots on the Braille sheets. People who are blind use a slate and stylus in the same way sighted people use a pad of paper and a pencil.

The slate and stylus are weightless, do not require batteries or electricity to operate, and fit easily in a pocket, a school bag, a purse or briefcase. As like pen and pencil, the slate and stylus is also not very expensive. Slate and stylus assistthe students for speedy writing, are simple to use, easy to carry to the classroom to take notes, and are a convenient and continuous mode for making embossed Braille dots to write Braille character. Together, a slate and stylus weigh about two ounces.

The Braille slate consists of arrangements of dots that create letters of the alphabet, numbers, and punctuation marks. The basic Braille symbol is called the Braille cell and consists of six dots, as you have read in Section 16.2 above. All symbols, letters, and numbers consist of one or more of these six dots. The six dots are commonly referred to by number according to their position in the cell.

Stylus has metal point for punching the dot into the page, and a small handle that can be firmly and comfortably gripped by the index finger and thumb. Although the shape and size of the handle may vary, all styluses will have a metal point for embossing Braille dots. And as like pen and pencils, variety of styles and sizes are available.

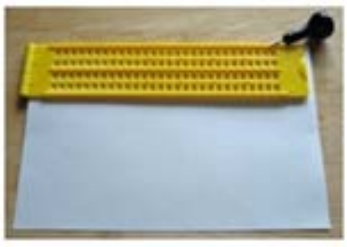
16.3.2 Procedure for Writing with Slate and Stylus

1) **Parts of a Traditional Slate**: A traditional slate consists of two sections of metal held together by a hinge. The bottom section has four rows of pitted cells, and the top section has four rows of openings or windows which fit over the pitted cells when the slate is in the closed position. The two larger holes on the left side are for the pins that hold the paper tightly.

2) **Loading the Slate**: Insert the paper between the top and bottom parts of the slate. There are two methods to load the slate:

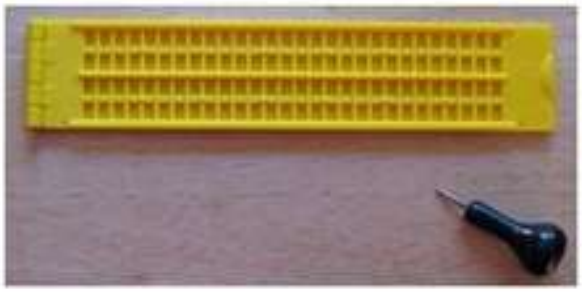
   - **Method 1**: Stand the slate on its edge, place the paper into the slate touching the hinge, and then close the slate.
   - **Method 2**: Place the slate flat in front of the child with the window part of the slate up and the hinged side on student's left side. While opening the slate, it will opens from right to left, like a book. Don't try to open the slate backwards; it will break the hinges. Notice that there is a small peg sticking up in each corner of the right-hand side of the slate and a little hole in each corner on the left-hand side. Place a piece of paper over the right-hand of the slate. The top of the paper should be even to the top of the slate and, the left side next to the hinges.

     Close the window part of the slate over the paper as like a closing a book and push it down firmly. You will hear the sound from four corner pegs poking through the paper into the corresponding holes to fix the paper in place. Now the slate is ready for use.



3) **Holding a Stylus**: Hold the stylus with the blunt pin end down and the knob or handle end up. The right hand forefinger curves over the top of the handle with the fingertip reaching down toward the pin. The thumb fits on the side of the handle, meeting the side of the forefinger.

4) **Writing**: The person writing begins from the upper right corner The stylus is positioned and pressed to form a depression in the paper. The writer moves to the various dots in the cell as appropriate to write a letter and then moves on to the next cell to write the next letter. The slate is repositioned as needed to continue writing on the paper.



Writing in reverse

While writing Braille with a slate and stylus, we must write the Braille characters right to left in reverse. The raised dots appear on the back side of the paper. When the paper is turned over, the dots face upward and it can be felt with the fingers. Read further to understand.

With the stylus, while we punch the letter **a,** begin with the last window in the top row; punch a dot in the top right corner of the cell, the number 4 position. This will appear raised in the number **1** position when the paper is turned over. Now move to the next window and make the letter **b** by punching dots 4 and 7. The letter **c** is easy; it is the top two dots of the cell. While writing words, skip a cell to leave a space between the words.

After completing all rows in the slate, open the slate, move the slate down the paper to where there is no Braille writing, close the slate and begin writing again. This is the way of writing in the four line Braille slate. If we write in A4 size Braille slate which is a 27-line, 28-cell full-page slate, there is no need to down the paper; without moving the paper we can write continuously till the end of the page. When you have completed writing, open the slate, remove the paper and turn it over to read the Braille you wrote.

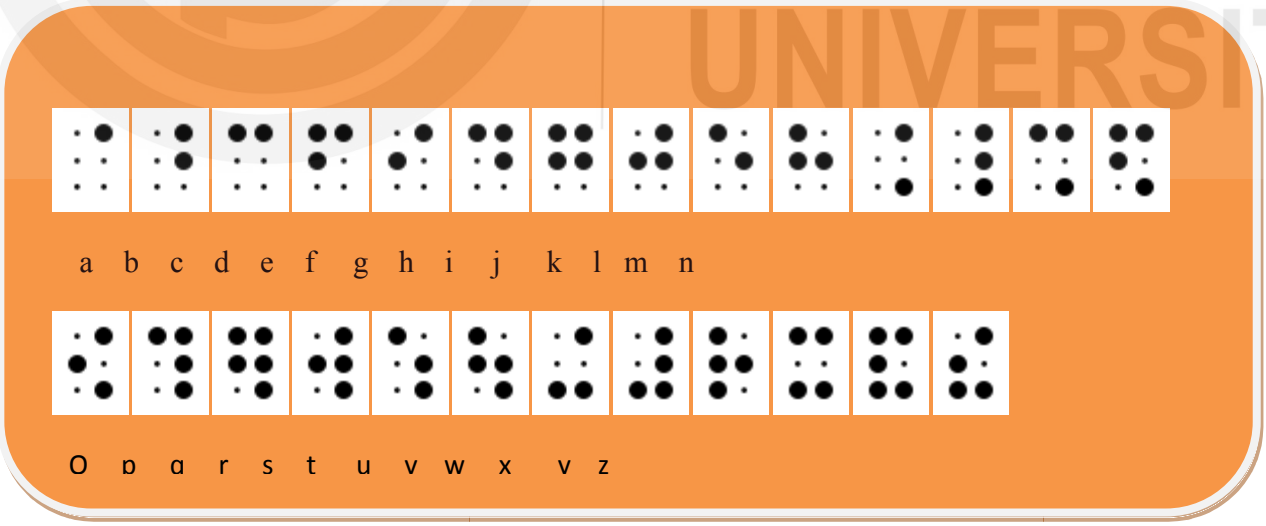


Image of Braille alphabet while writing with slate and stylus. When you have to read Braille, you have to reverse the paper and the punched holes will appear in reverse. So letter 'a' will appear as raised dot in Number 1 position.

16.3.3 Challenges of Learning to Write Braille

When writing with a slate and stylus, the Braille alphabet is written in reverse. This is due to the nature of the embossing process. this presents some challenges as follows:

1) **Orientation**: The main challenge of using a slate and stylus is the orientation. Since you are embossing the dots into the paper, the dots need to be made inverted; that is, Dots 1-2-3 are on the right rather than on the left.

2) **Writing Direction**: Unlike regular writing where you go left to right, with a slate and stylus, you write the Braille cells in reverse. This means writing from right to left. When you flip the paper over, the Braille reads correctly from left to right.

3) **Letter Formation**: Each Braille letter is formed by punching out the dots in reverse order. Start at the top-right cell window, and use your stylus to punch dots in the paper. When you have written your first letter, move to the cell window to the left of the first one, and punch out your next letter.

Remember, this method requires practice to become proficient. But once you get the hang of it, you'll be able to write Braille efficiently with a slate and stylus.

Reason for blind children to learn to use the slate and stylus

The sighted children learn to write with a pencil or pen and they can write quite quickly. As like sighted children we should develop in the children with visual impairment the ability to write quick, readable notes using a cheap and simple device such as the slate and stylus. If she or he has learnt Braille, they can write down information immediately, read it and review it anywhere and anytime. Also they can take class notes, note telephone messages, take down names, numbers or address. Any activity for which the sighted children use a pencil, slate and stylus can be used by children with visual impairment.

If the child learns to use the Braille slate and stylus, it is an asset for life. It can be used for doing home work, by school children, by college students to take class notes, and in adult life it is an outstanding tool for writing and editing a report.

16.3.4 Writing with Mechanical Braille Writer

A brailler, also called a mechanical braille writer, is a kind of braille typewriter. Paper is inserted in the machine. The raised braille dots that are made into the paper can be read with the fingers.

Identifying the keys

There is row of keys across the lower part of the brailler. The large key in the middle is the space bar. Use it to make a blank space between words and sentences.

The three smaller keys to the left and three to the right of the space bar correspond to the six dots in the braille cell and are used to make the braille characters.

The slightly raised key on the far left is the line down key; the similar key on the far right is the back space key. The large curved shape above the keys is the carriage return.

Paper is inserted through a slot in the top back of the brailler. The round grey knobs at each side of the brailler are turned towards you to roll the paper into the machine.

How to Use the Brailler

Imagine the braille cell spread out in a line like this: 321 456
Now transfer this pattern to the brailler keyboard:

- The key immediately to the left of the space bar is dot 1.
- The next key to the left is dot 2.
  The third key to the left is dot 3.
- The key immediately to the right of the space bar is dot 4.
- The next key to the right is dot 5.
- The third key to the right is dot 6.
- In your mind, number your fingers:
  - ✓ Left hand: pointer is dot 1, middle finger is dot 2, ring finger is dot 3
  - ✓ Right hand: pointer is dot 4, middle finger is dot 5, ring finger is dot 6.
  - ✓ To make the letter **a**, with your left hand finger 1 (pointer) press key
  - ✓ To make the letter **c**, press the keys for dots 1 and 4 (both pointer fingers) **at the same time.**
  - ✓ To write the word **run** press keys for dots 1, 2, 3, 5 **at the same time** for **r**; dots 1, 3, 6 **at the same time** for **u** and dots 1, 3, 4, 5 **at the same time** for **n**. You have brailled the word **run**. Press the space bar and braille another word.

Many innovations have come up in recent years as a substitute for braille reading and writing. For instance, there are sophisticated electronic equipments, such as talking machines and audio materials, which do not require the person to read braille. **But nevertheless, braille is still the primary mode of communication for the visually impaired individuals in India.**

Check Your Progress Exercise 2

1) What are the key features and components of a traditional braille slate and stylus, and how is it used for writing braille?

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2) Describe the process of writing braille with a slate and stylus, including how to handle the challenges related to writing direction and orientation.

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3) Explain the functionality of a mechanical braille writer (brailler), including its components and how it differs from using a braille slate and stylus.

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16.4 SUMMING UP

As you have read, braille is a tactile approach to reading and writing for visually impaired children, in which the letters are formed by the combination of raised dots in a cell. The cell consists of six dots which can be arranged into different combinations or characters.

Braille Overview:

Braille Cell: Consists of six dots arranged in a 3x2 grid. Different combinations represent letters and words.

Grades of Braille:

- Grade 1: Basic braille where each letter is written separately (e.g., 'cat' as separate letters).
- Grade 2: Contracted braille with symbols for common words and contractions (e.g., 'the' is represented by one symbol).
- Grade 3: Advanced, shorthand-like braille used for note-taking.

Pre-Reading/Readiness Activities:

- Tactile Discrimination: Develop a sense of touch through sorting objects, turning book pages, and counting items.
- Motivation to Read: Read stories, sing rhymes, and connect words to actions and objects to foster interest in reading.
- Concepts of Position and Space: Use touch-based games to teach spatial concepts like left/right, top/bottom, and inside/outside.
- Familiarity with Books: Teach the child to recognize book structure, including front/back, top/bottom, and page turning.

Braille Reading:

- Hand and Finger Position: Use both forefingers for reading. Ensure light touch and proper hand movement from left to right across the braille lines.
- Reading Method: Employ the 'sentence-word-letter' method, starting with sentences, then words, and finally letters for detailed reading practice.

Braille Writing:

- Slate and Stylus:
  - ✓ Slate: A tool with rows of pitted cells where paper is placed to emboss braille dots.
  - ✓ Stylus: Used to punch dots into the paper, creating braille characters.
  - ✓ Writing Procedure: Write from right to left, with raised dots appearing on the back of the paper. Reading is done left to right after reversing paper.
  - ✓ Challenges: Writing in reverse orientation and the complexity of letter formation.
- Mechanical Braille Writer (Brailler):
  - ✓ Keys: Correspond to the six dots of the braille cell.
  - ✓ Operation: Insert paper and use keys to emboss dots. Includes features like a space bar, line down key, and carriage return.

Alternatives to reading and writing braille:

Electronic devices and audio materials are available, but braille remains a crucial communication tool for the visually impaired.

Braille reading and writing are essential skills that bridge communication gaps for persons with visual impairment, enabling them to participate fully in everyday activities and education.

16.5 ANSWERS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress Exercise 1

1) Braille is classified into three levels: Grade 1, Grade 2, and Grade 3. Grade 1 braille represents each letter of the alphabet individually. It is used for basic writing and reading and is sufficient for those who do not require extensive reading, such as adults learning braille for daily use. Grade 2 braille is a contracted form where common prefixes, suffixes, pronouns, and other frequently used words are represented by specific symbols, making it more efficient for extensive reading, such as in textbooks for schoolchildren. Grade 3 braille is a more complex, shorthand-like system, used by professionals who need to take notes quickly and efficiently. It is less common due to its complexity.

2) Before a child can learn braille, they need to develop several readiness skills, including a well-developed sense of touch, memory, motivation to read, concepts of position and space, and familiarity with books. For tactile discrimination, activities might include sorting small items like peas and buttons or counting beads. To develop motivation, reading stories and associating words with real-life actions can be effective. Understanding concepts of position and space can be fostered through games that involve identifying left and right or moving hands from left to right. Familiarity with books can be developed by helping the child understand the structure of a book, including its top, bottom, front, and back, and how to turn pages and locate specific sections.

3) The recommended method for teaching braille reading and writing is the 'sentence-word-letter' approach, similar to how sighted children learn to read. This method involves starting with whole sentences to familiarize the child with how sentences are structured. For example, using a short poem helps the child learn to recognize and discriminate lines of braille. After this, the focus shifts to individual words using flash cards to help the child distinguish between words and learn word analysis (spelling out words) and word synthesis (combining letters to form words). This approach builds a foundation for reading and writing by gradually moving from understanding sentences to mastering individual words and letters.

Check Your Progress Exercise 2

1) A traditional braille slate consists of two metal sections held together by a hinge. The bottom section has pitted cells arranged in rows, while the top section has corresponding openings or windows that align with the pitted cells when the slate is closed. To use the slate and stylus, paper is inserted between these two sections. The stylus, which has a metal point for embossing dots and a handle for gripping, is used to punch dots into the paper through the openings in the top section. Writing is done from right to left in reverse order, as the raised dots will appear correctly when the paper is flipped over. This method involves aligning the paper correctly, holding the stylus properly, and moving it to form dots according to the braille alphabet.

2) When writing braille with a slate and stylus, the writing process involves several steps and considerations due to the nature of braille embossing. The slate and stylus are used to punch dots into the paper, with the writing done in reverse (right to left). This means that the dots are created on the opposite side of the paper, so when the paper is turned over, the dots appear correctly. Challenges include maintaining correct orientation since the braille cells are inverted, and writing in reverse requires practice to ensure that the final result reads correctly from left to right. To handle these challenges, the writer must become accustomed to the reverse order of writing and ensure that the paper is properly loaded and aligned in the slate.

3) A mechanical braille writer, or brailler, functions similarly to a typewriter but for braille. It features a row of keys corresponding to the

six dots of the braille cell, a space bar for creating blank spaces, and additional keys for line down and backspace functions. Paper is inserted through a slot and rolled into position using knobs. To write braille, the user presses combinations of keys that correspond to the dots in the braille cell, with the brailler embossing these dots into the paper. Unlike the slate and stylus, which require manual alignment and writing in reverse, the brailler allows for direct embossing of braille characters and facilitates faster and more efficient writing, especially for those who need to produce large volumes of text.