

# TEACHER AIDES

## Working with Students with Disabilities

BOOK G

# Vision Impairment



**This booklet is part of the series:**

**TEACHER AIDES Working with Students with Disabilities**

- **Book A** Disability studies: General
- **Book B** Autistic spectrum disorder
- **Book C** Hearing impairment
- **Book D** Intellectual impairment
- **Book E** Physical impairment
- **Book F** Speech-language impairment
- **Book G** Vision impairment

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- the Curriculum Advisory Committee
- school administrators
- advisory visiting teachers
- teachers
- therapists
- teacher aides
- students.

**Teacher Aides Working With Students With Disabilities**

**Book G: Vision Impairment**

ISBN: 0-7242-9301-9

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# Introduction

All students need to feel accepted, to have friends, to experience success, to have fun and to feel safe. Students with a vision impairment have these same needs—although they may require some extra support to have these needs met.

All members of the school community—staff, families and students—have a role to play in providing a positive and supportive school environment. Teacher aides who work with teachers trained in vision impairment have a significant role in assisting students with a vision impairment to participate fully in learning experiences and the full array of school activities.

If students are to feel as though they are members of an inclusive environment, it is necessary for all members of the school community to have:

- a positive attitude
- a belief in the student's abilities
- specific knowledge and skills
- a flexible approach.

The aim of these materials is to provide relevant information to you as a teacher aide to help you become better equipped to work with students with vision impairments in preschools, primary and secondary schools. As these students are all individuals and require different types and levels of support, it is not possible to provide information that is specific to an individual student. General principles and strategies will be discussed, and suggestions given about where you can go to acquire additional knowledge and skills and to find answers to questions about individual students with whom you are working.



# Section 1

## The nature of vision impairment

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### This section

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- **discusses the term 'vision impairment'**
- **describes how the eye works**
- **describes the population of students**
- **discusses some of the common causes of vision impairment in children**
- **explains how vision is measured**
- **describes low vision aids**
- **discusses the term 'functional vision'**
- **discusses access and participation.**

## The nature of vision impairment

The term *vision impairment* is used in this publication to denote any diagnosable condition of the eye or visual system which results in reduced visual functioning for learning.

Disease, damage or injury causing a vision impairment can occur to any part of the visual system, i.e. the eye, the visual pathway to the brain or the visual centre of the brain.

A vision impairment can:

- be present at birth
- occur at any time from disease or accident
- be part of a medical condition or syndrome.

Most visual conditions in children are stable and vision remains relatively unchanged. Some conditions, however, are progressive, resulting in reduced vision over varying periods.

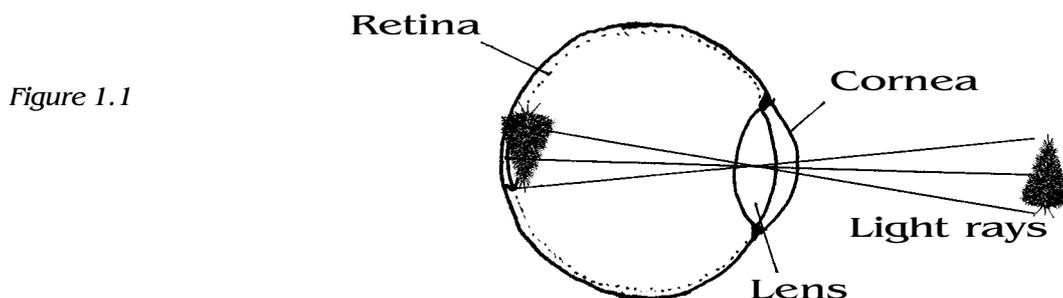
Nothing can take the place of vision. All other senses together cannot provide the depth nor detail of information that vision gives in a single glance. Vision is an aid to survival, a major sense used in learning, in social interaction and appreciating the varied artistic expressions of the world's many cultures.

In Queensland, about 1200 students (4% of the total school population) have been identified as having a vision impairment. This group includes 55 braille users. These students receive specialist support from trained teachers in vision impairment.

It is important to understand how students with a vision impairment see and learn in order to provide the student with the most appropriate support. The focus in this section is on understanding how the eye works and the function of vision in the learning process. The support teacher:vision impairment (ST:VI) will explain each student's eye condition to help teacher aides in their role.

## The eye

The eyes work like a camera and images are transmitted along the visual pathways to be processed in the brain as meaning. Vision undergoes rapid development during the first year of life and then continues to develop more slowly through to the teen years.



The eye is like a ball surrounded by a tough membrane (sclera) which is clear in the front (cornea). The eye is filled with fluid (aqueous humor and vitreous humor) to hold its shape. The fluid flows through specialised ducts and glands to keep the eye healthy and maintain the correct pressure.

The lens and the cornea are transparent to allow light to pass through to the retina at the the back of the eye. Depending on the distance from the object being viewed the lens changes shape to focus a clear image on the retina. The retina is very specialised and contains a sophisticated network of millions of nerve cells called rods and cones.

Cone cells respond to bright light and are active in producing clear central vision for fine detail.

Rods work in reduced illumination and are used in night vision. Rod vision detects movement and detail in the outer or peripheral area of vision.

From the retina the visual messages are relayed through the optic nerve which is a bundle of nerve fibres connecting the eye to the brain. The images are then processed in the visual centres of the brain.

The following diagram shows the various parts of the eye.

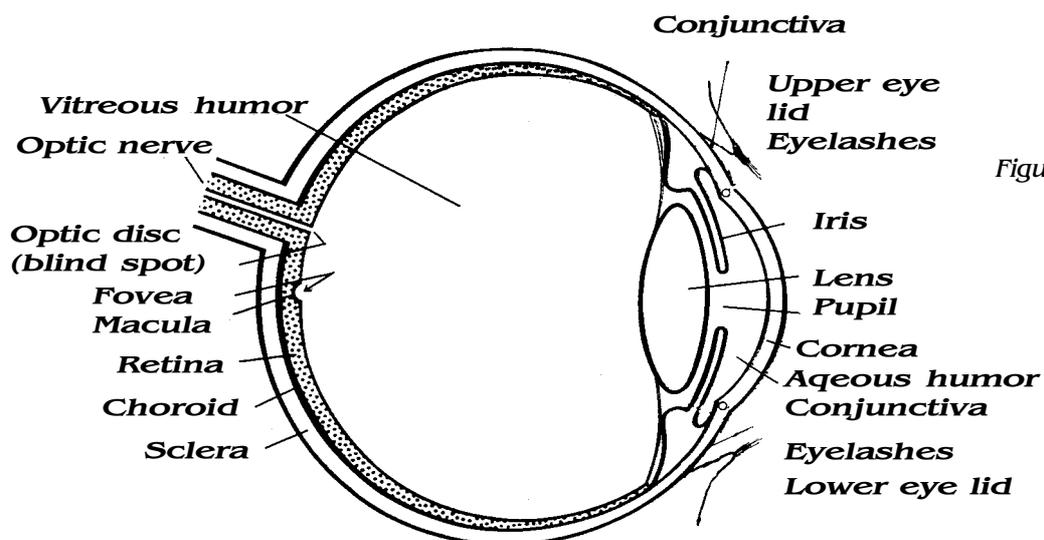


Figure 1.2

Visual problems can occur in any of the areas described above.

The population of students with a vision impairment is not homogeneous. The profile of students in this group will include students in the following categories:

- low vision to total blindness
- birth to school leaving age
- gifted to intellectually impaired
- more than one disability.

## The nature of vision impairment

In discussing the population of students with a vision impairment, it is important to note that two terms are used to highlight the student's educational need:

- Low vision
- Braille user.

### ***LOW VISION***

The term *Low vision* is used to refer to students who may have one or a more of the following:

- reduced ability to see objects clearly at a distance
- reduced ability to see objects clearly at a close distance
- loss of vision in central or peripheral field.

**These students will use print as their main learning medium.**

### ***BRILLE USER***

Refers to students whose severity of vision impairment requires them to use *braille* and other tactile and audio materials.

These students will be those:

- with no vision
- with only the ability to perceive light and dark
- with severely reduced visual acuity.

**There is a small group of students who will use some braille and some print depending on the visual demands of the task.**

## **Common causes of low vision**

In Australia the most common causes of vision impairment in children are:

- albinism
- cataracts
- high myopia
- optic atrophy
- retinitis pigmentosa
- macula degeneration.

### ***Albinism***

Present at birth, this hereditary condition features lack of pigment in skin, eyes and hair. Albinism affects distance vision, and is accompanied by nystagmus (a rhythmic movement of the eyes), sensitivity to glare and intolerance to exposure to direct sunlight. Many children with albinism have a refractive error requiring spectacle correction.

### ***Cataracts***

Cataracts can be present at birth but also can develop because of injury, disease or illness. The lens of the eye becomes cloudy which affects the transmission of light. Images appear blurry, colours fade and often there is a sensitivity to glare. Depending on the severity and type of the cataract, the lens can be removed and corrective lenses prescribed.

### ***High myopia***

High myopia or severe shortsightedness affects distance vision. Prescription spectacles or contact lenses are prescribed but do not correct vision to normal levels. Care needs to be taken with some physical activities as a blow to the head or eye can damage the retina.

### ***Optic atrophy***

Optic atrophy can be present at birth or caused by disease or injury. Damage to the optic nerve affects the clarity of the visual messages passing to the brain. Resultant vision can be blurred or incomplete. Loss of visual fields often occurs.

### ***Retinitis pigmentosa***

This hereditary condition is often called 'tunnel vision'. Vision is usually not affected until late primary or secondary years and more often in secondary years. One of the first signs is problems with night vision and later peripheral (side) vision is reduced. In school years central vision is usually unaffected.

### ***Macular degeneration***

The child with this hereditary condition usually has normal vision for most of the primary grades when a sudden loss of central vision can result in problems with distance and near vision.

**THE PAEDIATRIC LOW VISION CLINIC**

**at Vision Impairment Services**

**Low Incidence Unit**

**(17 Churchill Street, Buranda, Brisbane)**

**provides:**

**vision assessments, guidance and therapy**

**to all children with a vision impairment in Queensland.**

# Vision measurements

Information on each student's vision is an important factor when determining the need for optical and non-optical low vision aids, in making recommendations for modifications to the classroom or playground, and when evaluating the appropriate print size or reading medium. This information is obtained during a vision assessment by the child's ophthalmologist, a medical practitioner who specialises in the diagnosis and treatment of the eye, and an optometrist whose role includes prescribing corrective spectacles, contact lenses and low vision aids.

Some measurements of the child's vision includes:

- distance visual acuity
- near visual acuity
- refractive errors
- visual fields
- colour vision.

## *Distance visual acuity*

This measurement is expressed as a fraction, using the set testing distance of six metres as a guide and this figure appears on the top of an equation. Normal vision is 6/6 which means a person with normal vision can see a letter approximately one centimetre high from six metres.

A person with 6/18 visual acuity can identify from six metres a letter size that a person with normal vision can identify from 18 metres.

**The higher the bottom number on the equation, the lower the visual acuity, e.g. 6/9 is better vision than 6/18.**

Visual acuity is one of the guidelines used in determining the eligibility for educational support. Students with a visual acuity of 6/18 or less are considered for support.



## *Near visual acuity*

This measure is expressed in print size and the distance at which the child reads. Most students with low vision use a much shorter working distance than children with normal vision. More than 90 per cent of children with low vision can see small print, i.e. between N5-N8 but need an evaluation by their support teacher to determine the most appropriate size for most fluent reading.

Not all children with low vision need glasses or low vision aids for

reading. The student's optical needs are assessed by an optometrist who prescribes spectacles, contact lenses and low vision aids. While most students should be able to read regular print comfortably either with or without corrective lenses, some students need enlarged print.

### ***Refractive errors***

There are many people in the community who have a refractive error and need lenses to correct their vision to normal or near normal. While corrective lenses may improve the vision in people with vision impairment their vision will not be corrected to normal levels.

Refractive errors include:

- myopia or shortsightedness
- hyperopia or longsightedness
- astigmatism – an uneven curvature of the cornea which affects focusing
- a combination of above, e.g. myopic astigmatism or hyperopic astigmatism.

Refractive errors are generally corrected by glasses, although a small number of children wear contact lenses.

### ***Visual fields***

The visual field is the total area, left and right/above and below, a person sees while looking straight ahead.

Some eye conditions cause visual field defects and affect the ability of a student to function in their environment. Eye conditions can affect different parts of the visual field:

- if the damage is in the central region, the ability to see fine detail is impaired.
- if the damage is in the peripheral region, the ability to move around the environment is impaired.

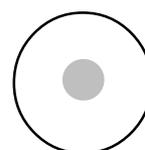
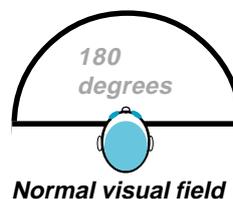
Some conditions result in loss of half or a portion of the visual field in one or both eyes while others cause patches where vision is poorer.

Listed are examples of visual field defects.

#### **CENTRAL**

eye condition: macular degeneration

- problems with fine detail such as recognising faces.
- may need larger print and low vision aids.



## The nature of vision impairment

### PERIPHERAL (tunnel) VISION

eye condition: retinitis pigmentosa

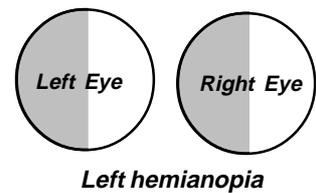
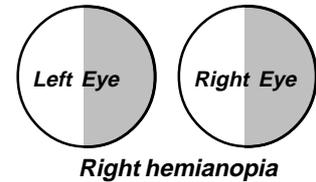
- problems with mobility, bumping or tripping into objects outside visual field
- severe problems at night or in dim light
- central vision is usually intact.



### HEMIANOPIA (half field loss)

eye condition: optic atrophy

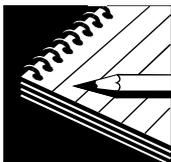
- loss of vision in half the left or right field in both eyes
- can be nose side or temple side
- some mobility problems, such as in road crossing
- some reading problems if reading into the *blind* field area.



**PATCHES** (blind spots or distortions over the whole visual field)

eye condition: optic atrophy

- loss of detail in the area of damage.



Activity 1.1

**V F** Cut a cardboard strip about 27cm long and 7cm wide and cut a circle about 3mm in diameter to fit directly in front of one of your eyes. This simulates a peripheral visual field in one eye of about 15 degrees.

**I I**

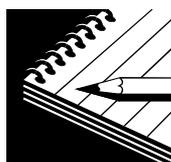
**S E** Wrap the cardboard strip around the side of your head so that you are just looking through the hole. Try reading material on the board about 3m away.

**U L** You will notice that vision through the hole is usually clear but all side vision is eliminated. You will need to move your head to compensate for this field loss.

**A D**

**L S**

Imagine crossing a road with this level of vision.



Activity 1.2

**V F** Cut a piece of clear plastic the same dimension as the cardboard strip above. Using a black marking pen or glue mark out a rough circle shape about 2cm in diameter in the place directly in front of each eye.

**I I**

**S E**

**U L**

**A D** Try reading an article from the newspaper while looking through the plastic.

**L S**

## ***Colour vision***

Colour vision defects are present in the community with a greater percentage of boys than girls affected. Red-green problems are the most common. These hereditary colour vision problems are present in the the vision impaired population but there are also some eye conditions that affect colour vision. Colour vision and fine detail are processed by the central part of the retina and any condition affecting this area can cause a colour vision defect.

There is a small percentage of students who have no colour vision and see everything in shades of grey similar to images on a black and white television.

If a colour vision defect is present care should be taken not to use colour cues or directions and when presenting work on the board, some colours will not be seen against the green surface.

### **Misconceptions about vision**

- Sight can be saved or conserved by restricting its use.
- All vision problems can be corrected by wearing glasses.
- Reading at a close distance will harm the eyes.
- All blind people only see blackness.
- Blind people have a sixth sense to compensate for loss of sight.
- Only boys have colour vision defects.
- Braille is out of date and is no longer needed.
- Blind people are musically gifted.

## **Low vision aids**

Many children with low vision are prescribed glasses or low vision aids to assist with visual tasks. Depending on the eye condition, the acuity and the task, the student may have one or more aids to assist. No one aid will perform all tasks. The teacher aide should have an understanding of the type of aid, its use and its care. As a rule most young students accept and adjust to wearing or using glasses or aids but this approach can change as the perceived attitudes of the peer group become more influential.

Students may need greater encouragement to use low vision aids as they reach high school age. A confident student is able to respond to questions, know about the eye condition, and feel comfortable using low vision aids.

Teacher aides who work closely with students are in a position to provide opportunities for students to practise such interactions to increase their confidence.

## The nature of vision impairment

Low vision aids are available as:

- 1 optical aids
- 2 non-optical aids
- 3 technological aids.

### 1 Optical aids

The most common optical aids are spectacles.

#### *Spectacles*

The type or form of spectacles depends on the prescription and visual needs of the child. They can include:

- single sight – one distance or near prescription in both lenses
- bifocal – with distance prescription on top and a reading prescription in the bottom of the lens.

The strength of the prescription can determine the thickness or form of the lenses and specialised low vision lenses are often prescribed. It is important to know the purpose of the glasses prescribed to ensure the child is able to function as well as possible.

### Handy hint

#### CARE OF SPECTACLES

Children are encouraged to take responsibility for the care of their spectacles from early primary years – they can be costly and difficult to replace.

Daily washing with warm soapy water and drying with a soft cloth should be part of the regular routine. Younger children usually need their glasses cleaned more often.

Because children are so active it is important to check that spectacles fit correctly and comfortably as they can readily lose their shape with a bump or knock. The teacher aide could check regularly to ensure frames are not causing discomfort to the child. Parents should be informed so that appropriate action can be taken.

#### *Spectacles – warning signs*

Students with low vision should have regular eye examinations to monitor the eye condition in addition to checking that spectacle prescriptions or low vision aids are current. Prescriptions can change over time as can visual demands and students with low vision need to be monitored closely to ensure their visual needs are met.

The teacher aide working with the child may notice signs before other support personnel. These signs can be observed in students whether they wear glasses or not.

These signs may be an indicator that a change in vision is occurring or there is a need for replacement lenses.

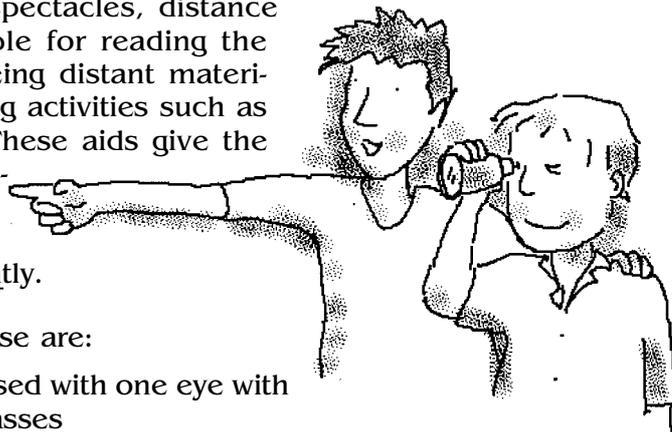
The signs include:

- eye rubbing
- reluctance to read material of the size which was read previously
- complaints of not being able to see the work
- pulling glasses down on the nose
- looking at the board through the bottom part of glasses
- putting on and taking off glasses excessively
- scratched lenses
- poorly fitting frames - arms too short, frame too small, frame twisted.

These observations should be discussed with the support teacher to ensure appropriate action is taken.

### **FOR DISTANCE TASKS**

In addition to spectacles, distance aids are available for reading the blackboard, seeing distant materials, and watching activities such as presentations. These aids give the student an opportunity to obtain information independently.



Examples of these are:

- a telescope used with one eye with or without glasses
- binoculars used with or without glasses
- head-mounted or spectacle-mounted telescopes.

### **FOR NEAR TASKS**

Near low vision aids such as magnifiers can be used with or without glasses. They can assist in reading very small print or symbols.

These magnifiers come in a wide range of magnifications and shapes. Where magnification is increased, the size of the lens is smaller. With higher magnification the reading field is smaller and the working distance is closer.



*Reading with a magnifier*

## 2 Non-optical aids

In addition to optical aids non-optical aids can also assist in the student's visual functioning. Some of these are as follows:

- lamps
- dark lined books for writing
- large print books or photo-enlarged material
- dark pens or pencils
- hats or shades
- typoscopes – any device used to isolate words, letters or lines while reading or writing
- reading/writing/typing stands which provide an angled working station to assist with posture
- tactile rulers or markers
- coloured overlays to reduce glare
- tinted windows
- sunglasses.

## 3 Technological aids

Over the past ten years advances in technology for students with low vision and braille users have assisted communication greatly. Further developments in voice activated technology will increase access to information.

One low vision aid or piece of technology will not perform all tasks. The decision to purchase expensive equipment should be based on balancing the needs of students with the range of tasks to be performed.

When choosing equipment it is important to consider the training needs for student and staff.

The teacher aide plays a vital role in assisting the student to use equipment.



*Reading with a closed circuit television (CCTV)*

## Functional vision

While it is important to know about the student's eye condition it is vital to learn how each student's vision is used and to monitor visual performance in the learning environment. From these observations recommendations for modifications, materials and equipment are made by the support teacher:vision impairment.

The teacher aide plays an important role in helping to observe students.

Functional assessments can be formal or informal and are used to:

- gain a profile of the student's use of vision through a systematic observation in a variety of tasks and environments at school, on excursions, camps etc
- supplement clinical assessments – providing information to medical and educational professionals
- determine strategies and resources to further enhance the student's use of vision
- review the use of aids, specialised materials, and equipment for the tasks prescribed.

## Access and participation

Having a vision impairment interferes with the gathering of information as most knowledge about the world (more than 80 per cent) is gained through the sense of sight. Much learning is incidental and occurs through observation.

Information that can be accessed at a glance by a sighted person may need to be taught to the student with a vision impairment. This has important implications for access and participation in the learning environment because students require:

- purposeful exposure to a range and variety of experiences with opportunities to interact with the environment using all the senses
- access to materials in the appropriate format
- the teaching of specific skills that will facilitate access to the environment and develop or increase independence.

### ***Exposure to a range and variety of experiences***

Children with vision impairment have reduced opportunities to access information and less contact with the physical and social environment. As other senses are not as effective as vision in gathering the information, the learning environment has to be structured to provide students with opportunities to participate in activities and gain from experiences that may otherwise be denied them.

Students will require direct teaching in developing concepts. For example, concrete materials are used to teach such concepts as size and shape.

Students will also benefit from direct and structured teaching of appropriate social skills in conversation and non-verbal interactions.

## The nature of vision impairment

For example, role play assists the student in developing appropriate posture, tone of voice and body language.

Being able to move safely and successfully through the environment ensures the student can participate independently in a range of experiences. With good mobility skills, young children are able to explore new environments. The feeling of independence increases when students have the skills to complete the task themselves. Orientation and mobility training assists students to develop these skills.

It is important that students are provided with a safe environment and appropriate support so that necessary skills can be learned and developed. The student's needs are identified through an individual educational plan.

## Access to materials

Environmental information such as signs, timetables and directories are an integral part of everyday life. Text books and handouts at school and books for recreational reading are also part of the educational environment.

Having access to the range and variety of print information is as important to students with a vision impairment as it is to other members of society. While most printed texts are accessible to print-using students, some students require brailled material. Some illustrations may not successfully be converted to a tactile form.

Whenever possible students with a vision impairment should have access to required resources in the appropriate format at the same time as their normal-sighted peers.

## Teaching specific skills

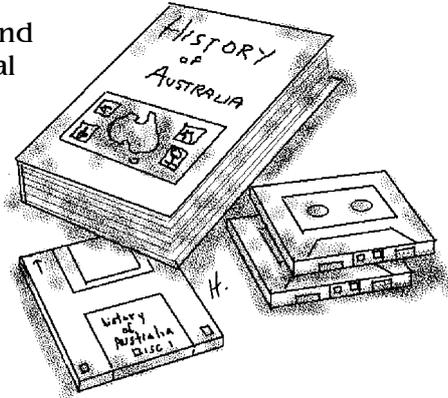
The majority of students with a vision impairment are in primary and secondary schools. They will undertake the same curriculum as their sighted peers in the Key Learning Areas with alternative strategies and modifications. For example, some secondary subjects such as Japanese may present problems with identification and writing of complex symbols.

Health and physical education may present some restrictions in movement and participation; science and manual arts subjects will require modification to equipment and tools to allow for safe participation.

To ensure access to and participation in school programs, students with vision impairment may require additional or alternative materials and assistance.

Examples follow.

- Communication: braille literacy and numeracy, other braille codes, listening skills, keyboard skills, handwriting, non-verbal communication.
- Orientation and mobility: body and environmental awareness, spatial knowledge and understanding, independent travel.
- Social skills: socially acceptable behaviour, self esteem, self advocacy, appropriate use of language.
- Concept development: developing better knowledge of features in one's environment.
- Motor skills: fine and gross motor abilities
- Use of technology: use of high and low tech devices, adaptive technology.
- Vision efficiency training: best use of functional vision.
- Recreation skills: ability to participate in leisure activities.
- Activities for daily living: self care, organisation skills, time management.
- Vocational and employment opportunities: time management, interpersonal skills, work skills.

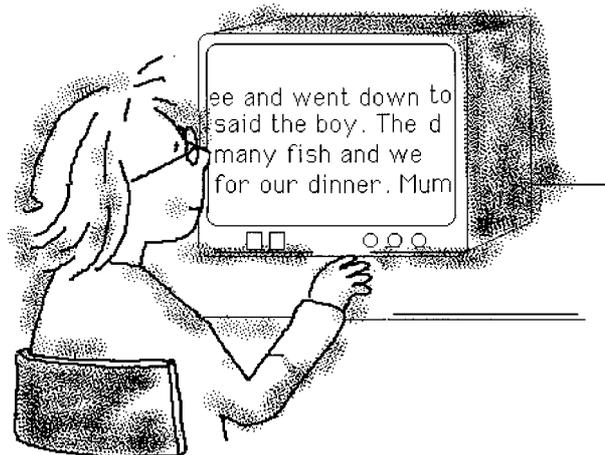


Programs for students with vision impairment should incorporate:

- specialised support from teachers with expertise in vision impairment
- other allied professionals
- teacher aide support
- appropriate follow-up by school staff in specialist areas
- specialised equipment and adaptive technology
- alternative teaching strategies
- appropriate format materials in braille, tactile, audio and print
- additional curriculum areas that are specific to vision impairment
- special considerations for assessments, e.g. extra time for exams.

## Summary

- The term *vision impairment* covers two groups of students:
  - those with low vision who use print
  - those with little or no vision who use braille.
- Students with vision impairment have a wide range of eye conditions which affect their functioning in the learning environment.
- A range of measurements of vision is used to gather information on each student.
- Low vision aids and specialised technology are used by most students during their school years.
- Information on how each student functions in the learning environment helps to develop programs and devise strategies to assist.
- Misconceptions about blindness and low vision are explained.
- Students with a vision impairment can access and participate in most of the curriculum with planning, training, provision of additional learning opportunities, preparation of appropriate materials and equipment.



## Section 2

### The educational effects of vision impairment

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#### This section

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- describes the effect that a vision impairment may have on the students' participation in school curriculum
- describes the ways vision impairment can affect
  - communication
  - orientation and mobility
  - concept development
  - life skills
  - social skills.

## The educational effects of vision impairment

In Section One the nature of vision impairment and the general effects for a student in accessing the learning environment was described. This section look more closely at specific aspects of the educational situation and the curriculum.

All individuals, including those with a disability, differ in their attitudes, abilities, motivation to learn, learning styles, skills and knowledge. Some may be gifted and talented, and some may have additional disabilities. This section does not focus on the needs of the student with additional disabilities. It is suggested the reader refer to other booklets in this series for further information on other disabilities.

It is important to consider the student as a 'whole', not focus on the disability. A vision impairment is only one factor that affects the student's learning and the opportunity to achieve to the fullest potential. While some eye conditions will be mentioned the ST:VI can give the teacher aide detailed information on those which apply to a particular student. Even students with the same eye condition may perform differently and have different needs.

Vision impairment has an effect across all learning environments and key learning areas. The following areas are outlined:

- communication
  - listening
  - speaking
  - viewing
  - reading
  - writing
- use of technology
- orientation and mobility
- concept development
- life skills
- social skills.

## Communication

Communication involves the sending and receiving of messages. Non-verbal communication (e.g. gestures, facial expressions and body language), and verbal and written forms of communication are ways of exchanging messages. Receiving these messages involves reading, listening and viewing (taking in visual information). Impaired vision may affect the intake of visual information, and opportunities for learning will need to be planned.

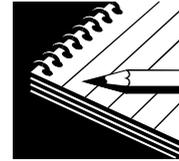
A variety of experiences are necessary for a student to become competent in communication.

## Initiating conversation

Imagine you are blind and standing on a street corner. You need directions.

Close your eyes. Think about how you will start up a conversation with someone as they go by.

- What features in the immediate environment could affect how you complete this task?
- How would you initiate contact?
- Is there any strategy, equipment or technology that would have made the task easier or more comfortable?



Activity 2.1

## *Listening*

Listening cannot replace vision. Being able to recognise and associate an object, person or action with a sound is necessary to make meaning out of a situation. First hand experiences are essential to make sense of a situation.

Students with a vision impairment use listening skills to:

- recognise voices and sounds
- gather information from verbal communication
- select pertinent features from verbal communication
- gather and monitor environmental information.

Gathering information through listening has limitation because of:

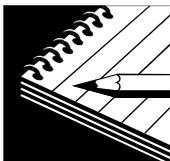
- fatigue caused by concentration
- difficulty in interpreting silences
- the lack of other clues – information is not complete.

Listening is very important to students with a vision impairment. It provides an avenue for transmitting educational information and is important for the student's safety when moving around.

As the student progresses through school, taped information and programs using synthetic speech are increasingly used. These require well developed listening skills.

There are many programs available to assist in developing these skills.

## The educational effects of vision impairment



Activity 2.2

### Listening

Have a friend blindfold you and take you to a place (e.g. cafe or park) without indicating where you are. Sit and listen to the sounds in the environment – people, activities, environmental sound. Remove the blindfold and compare the additional information that is now available by using vision.

### *Speaking*

Vision impairment has little effect on students' **language development**.

Students with a vision impairment, particularly those with no sight, may often use verbal communication in a form that may not be socially acceptable. Inappropriate use of language and speech is sometimes used in an attempt to avoid silence and to keep another person engaged and 'in contact'. For example students may:

- talk aloud to themselves
- engage others in conversation with unrelated and constant questioning
- break into a conversation group by imposing or introducing a non related topic
- continue speaking after people have left.

Where necessary, students will need some specialised educational support to develop appropriate verbal communication skills.

### *Viewing*

Many classroom activities rely on students' using their vision. Because of their vision impairment, students may receive information that is limited, distorted or inaccurate.

Other senses – hearing, smell, touch – are not as efficient as vision for gaining information and this must be considered when developing education programs for the class to ensure the inclusion of the student with a vision impairment.

### *Reading*

The level of near vision is a major factor in determining the choice of reading medium, i.e. the use of print or braille. Usually, only one form is taught, although in a few cases both may be used. The decision is made by the ST:VI in consultation with the school, parents and the student.

Many students with low vision use the same size print as their sighted peers.

Sometimes glasses or other aids are prescribed (magnifiers or closed circuit televisions) to assist with reading and writing. The ST:VI advises on training and monitoring strategies to assist in the application of these devices and the teacher aide may participate in these programs.



*Students with low vision need to be close to reading and writing materials.*

There are some students who will need enlarged materials because of their eye condition or who experience problems with processing of some visual information. The ST:VI will advise the appropriate size text for each student.

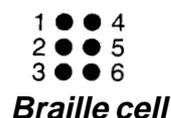
Some of the difficulties students encounter are:

- coloured print is often difficult to read
- text over pictures is hard to distinguish
- pictures can be too detailed and congested to interpret
- some mathematics symbols which are smaller than regular text
- glare or bright light on shiny pages
- overhead transparencies
- printed information located in the distance
- close working distance can cause fatigue and postural discomfort.

### ***Braille***

Braille is a tactile reading and writing system that does not represent the shape nor the size of print. It is based on a cell of six dots. (See right)

Students are introduced to the code in a particular sequence. Braille letters and words that are the easiest to discriminate tactually are taught first. As the reader progresses, more difficult combinations are introduced. In most cases, braille learners require one-to-one teaching.



In addition to literary braille, there are a number of other codes that need to be taught such as mathematics and science, music, foreign languages and computer codes.

## The educational impact of vision impairment

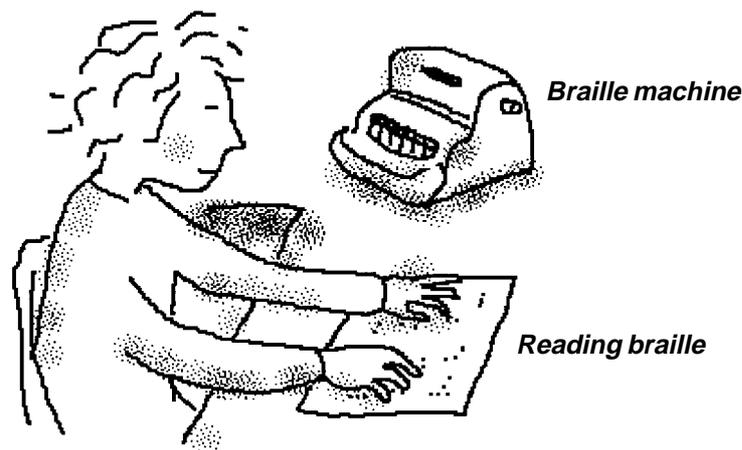
**Teacher aides will need to learn literary braille if they are working with braille-using students.**

The reading rate for a competent braille reader is much slower than that of a print reader of similar ability.

### ***Some factors affecting classroom management***

- Braille takes up considerably more space compared with the equivalent printed texts. Extra space is required for storage and on table tops when the student is reading.
- There are fewer braille books than print books available.
- Planning is required to produce braille books.

**Specialised reading materials are available from Vision Impairment Services, Low Incidence Unit  
17 Churchill Street, Buranda, Brisbane.**



### ***Writing***

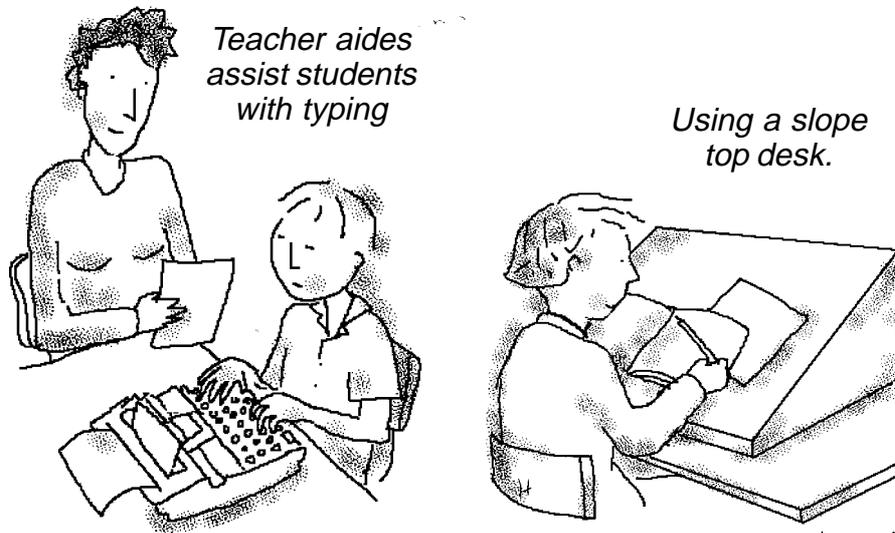
#### ***Print users***

Some students with low vision write neatly and legibly while the writing of others may be hard to read. Handwriting for these students can be tiring because:

- they have to be closer to the page and this can cause strain to neck and back muscles
- hand-eye coordination takes longer.

It is standard practice to teach keyboarding in middle primary school to avoid problems of slow and illegible handwriting and to gain a reasonable typing speed by high school. Typing skills readily transfer to computer work. A sloped desk or raised-top desk may be used to assist with reading and writing activities.

For a student with low vision, copying or reading from the board can take additional effort and time. Some students use telescopes to read boardwork or distance materials. Other strategies can include providing the student with a print copy of boardwork or overhead transparencies.



### **Braille users**

The braille code and the use of the braille machine is taught by trained teachers. Students initially learn braille on the Perkins Braille machine.

Teacher aides will also need to learn to read and write braille with the assistance of a ST:VI. Once a student is proficient, braille writing is usually faster than print writing.

Once the student is proficient with the braille machine, more sophisticated technology may be introduced (e.g. specialised lap top computers with braille or qwerty keyboards).

In addition to working directly with students teacher aides may be required to produce large quantities of braille texts. A computer and braille embosser is used here. Training programs are organised by the ST:VI.

## **Use of technology**

Technology available to braille users and print users is constantly changing and can be expensive. To choose equipment requires informed decision-making to ensure:

- compatibility between pieces of equipment
- relevance to the tasks required
- application to the widest range of tasks over time.

## The educational impact of vision impairment



Teacher aides may be required to learn how to use some of these specialised pieces of equipment.

## Orientation and mobility

For sighted children independent movement occurs as a natural development of exploring and observing the environment. Vision is the main motivator for movement and opportunities to explore provide immediate rewards.

For a child with low vision or who is blind without opportunities for incidental learning, experiences need to be organised and structured. Some movements need to be taught and practised regularly. Orientation and mobility training promotes safe, efficient, graceful and independent movement. Several aspects of developing orientation and mobility skills are outlined.

### ***Sensory motor development***

This involves the development of fine motor skills, gross motor skills and the integration of sensory information. Together, these form the fundamental movement patterns, including standing, walking and running.

Vision plays a major role in normal sensory motor development. For students who are blind or have low vision, achieving developmental milestones can be slower than for sighted children. To minimise the effect of the vision impairment it is essential that a wide range of experiences be initiated through creative opportunities by parents and other adults.

### ***Orientation***

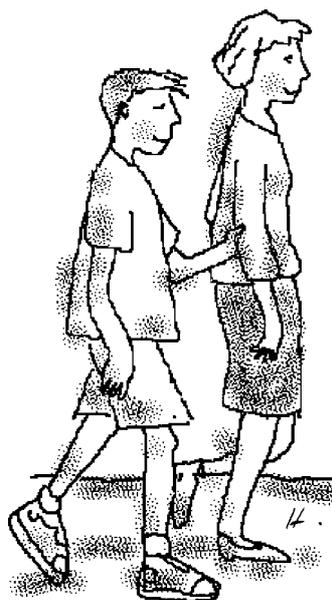
This is the ability to learn about the body and the space it moves in. It enables students to develop a mental picture of themselves in their environment. Essential aspects of orientation are thinking, reasoning and problem solving.

### ***Mobility***

This follows on from orientation. It is about being able to move safely in one's environment.

A vision impairment reduces the clues available to the individual. Students with a vision impairment require specialised teaching in

strategies to learn about their immediate environment and ways to investigate and move safely in unfamiliar areas.



### ***Using a long cane***

To achieve independent movement and mobility, some students may need to be introduced to an adaptive cane or long cane. This assists with gait, walking speed, and can be used as a warning device. Various cane techniques need to be taught as the student grows and moves about in the community.

These skills are taught by an orientation and mobility teacher or instructor. The student with a vision impairment needs to explore independently before being expected to travel longer distances alone.

Awareness of routes travelled regularly and the ability to retrace a route to a set destination will make the traveller more

independent. Independence makes the child more confident to take on further and more complex daily life tasks.

## **The educational effect of vision impairment**

*For further information about orientation and mobility skills, contact Vision Impairment Services, Low Incidence Unit, 17 Churchill Street, Buranda, (07) 3247 3288 or Guide Dogs for the Blind.*

## **Environmental awareness**

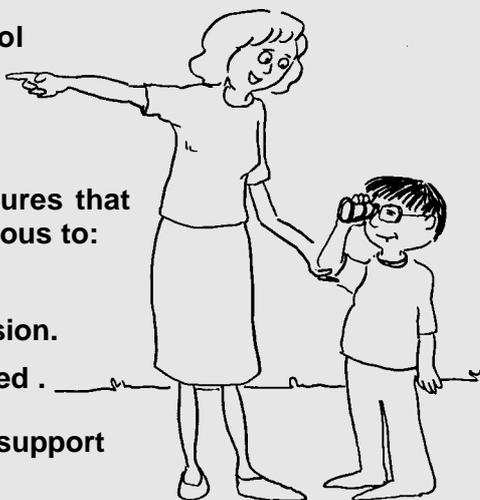
**Arrange to visit a school campus, and select one area that has at least three buildings.**

**Walk around noting features that you feel could be dangerous to:**

- a blind person
- a person with low vision.

**List modifications required .**

**Discuss these with the support teacher or principal.**



**Activity 2.3**

## Concept development

Concepts are formed as a result of all incoming sensory information and perceptions being processed and combined in the brain. The range and variety of experiences forms the basis of concept development. Concepts are constantly changing as new information is gathered. Vision impairment reduces the opportunity for first-hand experience, so concept development can be slower, or in a different sequence from sighted peers.

Some areas of development seem to be affected more than others. This has implications across formal and informal learning experiences at home and at school. In the school situation, some of the areas that require special teaching include concepts of space (including body image), number, classification, time, logical thinking and problem solving. For example, **body concepts** may be slow to develop. Some research has shown that poor body image can result in poor self concept.

Accurate **spatial concepts** develop from accurate body concepts. They form an essential component in understanding the world.

In particular, students who are blind will need to develop accurate spatial concepts as this is fundamental to independent and meaningful movement. While spatial concepts are usually learned incidentally by sighted students, specific programs need to be designed to provide learning opportunities for students with vision impairment.

Experience with concrete items is essential for students with a vision impairment and development of some concepts may take longer than for sighted peers.

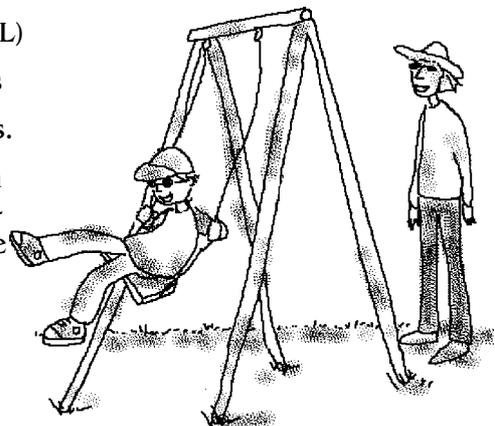
To provide students with a range of experiences necessary for learning concepts may take additional time.

## Life skills

Life skills are those skills which allow people to live independently in society. They include:

- activities of daily living (ADL)
- vocational and career skills
- leisure and recreation skills.

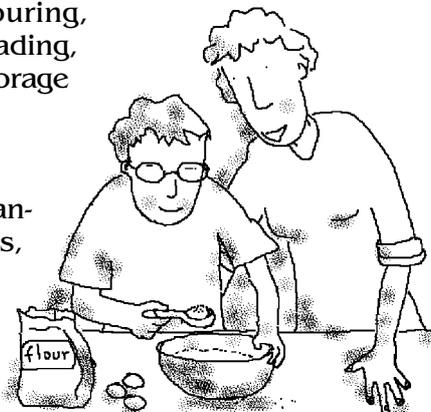
These skills assist students with a vision impairment to live independently and safely in the community.



## Activities of daily living (ADL)

ADL skills include:

- personal management of eating, toileting, dressing, grooming, clothing care, phone usage, time telling, and medication management
- food preparation including pouring, cutting, peeling, measuring, spreading, stove use, recipe management, storage of ingredients and foodstuffs
- money management  
including recognition of money, handling money and making purchases, budgeting and banking
- home management  
including bed making, cleaning, washing, drying, ironing, sewing, organisation and simple repair work.



The educational  
impact of vision  
impairment

### Helpful hint

Students are taught simple modifications to techniques and use of adaptive equipment. For example, when pouring a cup of tea using a *liquid level indicator* is more socially acceptable and safer than placing one's a finger in the cup.

### WORKING IN PAIRS

#### Partner X and Partner Y

Not in Partner Y's presence, Partner X prepares a child's lunch box using some of the following items:

- a fruit juice
- sandwiches with a variety of fillings packaged together in plastic wrap
- a cheese stick
- a muesli bar
- a dessert in a container
- fresh fruit not peeled or quartered
- two biscuits in plastic wrap

Partner Y is blindfolded, and given the lunchbox.

After lunch, describe the contents of what was eaten to Partner X.

List any improvements that could be made to help a student who is blind.



Activity 2.4

## The educational impact of vision impairment



Activity 2.5

### AT HOME

Go to your wardrobe. Close your eyes.

Select an outfit to wear to either a barbecue or a formal dinner.

When you have made your selection, open your eyes and check the items.

Make some suggestions on how your wardrobe could be organised to make the task easier.

### *Vocational and career skills*

Technology has broadened career choices for all people, but the range of options is still limited for people with disabilities.

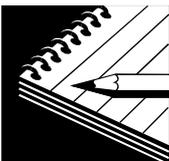
Students will require guidance about possible occupations. Some students may need further counselling, particularly those with deteriorating eye conditions or who have lost their sight through accident or illness.

This advice could include information on:

- realistic career goals
- requirements of the job
- available assistance.

Necessary skills for the workplace are developed throughout the schooling years. These can include punctuality, following directions, care of equipment and personal organisation.

Students with vision impairment should be required to maintain the same standards as their peers but may require some additional assistance to develop these skills.



Activity 2.6

### Employment options

- List three occupations that are realistic for a person who is blind.
- List three occupations that are realistic for a person with low vision.
- Against each of these, write five of the main tasks involved in the job for which the individual may need assistance or adaptations of some kind.
- Suggest adaptations for each of these (special equipment, a personal reader, a braille copy of procedures etc.).

## ***Leisure and recreation skills***

Access to some activities may be constrained for students with vision impairment. To broaden opportunities, some modifications and skilling may be necessary.

Examples follow.

- Crafts and hobbies may need to be modified where assembly details are only available in print.
- Some board and card games are available in large print or braille. The operations of the games need to be taught before the student starts to play with sighted peers.
- Physical activities including sport. Individual activities require least modification (e.g. bushwalking, swimming, camping, athletics). Team games require modification for the student with vision impairment. The student may have difficulties with activities such as fast ball games.



International rules for the disabled apply in some sports. Some games have been developed specifically for vision impairment, and sighted children also can play (swish, blind cricket, goalball). Exposure to a variety of recreation and leisure activities allow students make informed choices.

## **Social skills**

Socialisation starts with the child's earliest interactions. Early attachment forms the basis for further social development and positive self concept. Having a breadth of experience helps the child feel confident, self assured and valued.

While many social skills are usually learned incidentally by sighted students, those with a vision impairment may need opportunities to develop these skills.

Vision impairment may limit awareness and knowledge of the community, its responsibilities, and the relationships between individuals.

Students with a vision impairment may not be able to see interactions between others and this may affect the knowledge and understanding of:

- the different meanings that silence can convey
- the social conventions about personal space
- the conventions for initiating and continuing conversations.

## The educational effect of vision impairment

Like other students, it is important for students with a vision impairment to develop abilities to handle an array of social situation (e.g. negative reactions, adapting behaviour to participate in specific groups).

Some students may exhibit behaviours that are not socially acceptable. The teacher aide assists the teacher in helping the student develop appropriate behaviours.

## Summary

The educational effects of a vision impairment are as individual as each student.

- With access to a wide range of experiences and opportunities students can participate in most school activities provided that appropriate materials are available.
- As vision plays a major part in normal sensory development, particularly movement, the child with severe low vision or who is blind needs to learn to move around safely. Training programs in orientation and mobility are provided by specialist teachers. Teacher aides can also be involved.
- Much of children's learning comes from observations and interactions with the environment. This incidental learning is not as readily accessible to students with a vision impairment. Learning opportunities are organised to assist in the development of concepts.
- Students with a vision impairment learn skills to assist in their daily living, sport and leisure and careers so they can participate in the community as independently as possible.
- Development of social skills is an important element of daily living. A vision impairment can result in lack of awareness of appropriate behaviours in social encounters. Some training in this area can help the child participate in a wide range of social situations.

## Section 3

### Responses to vision impairment in the learning environment

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#### This section

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- details the content of an educational program of a student with a vision impairment, (a print user or a braille user)
- details and explains a variety of skills required by a teacher aide when supporting a print user and a braille user. These include:
  - direct support to the student
  - preparation of the learning/teaching environment
  - adaptation or development of resources
  - acquisition and storage of specialist equipment and resources.

Previous sections discussed the nature of vision impairment and the effect that it may have on the education of the student with a vision impairment.

This section looks specifically at the educational response. The major emphasis here is on the specific tasks a teacher aide may be required to undertake.

## **The educational program**

### ***Ascertainment***

The ascertainment process is used to identify the specialist educational support needs of students with disabilities.

A number of professionals are involved in this process and in recommending relevant educational programs.

### ***Individual Education Plan***

An Individual Education Plan (IEP) is developed to meet the needs of the student.

The IEP is delivered by:

- class or subject area teacher or teachers
- teachers trained in vision impairment  
(support teacher:vision impairment, based in a unit or cluster school or advisory visiting teacher:vision impairment)
- other professionals as needed.

Other professionals may include:

- specialist teacher (e.g. physical education, music)
- guidance officer
- therapists (physiotherapist, occupational therapist, speech-language pathologist)
- orientation and mobility specialist, learning support teacher, integration teacher
- professionals from other disciplines, such as ophthalmologist, optometrist.

Other individuals who may also be involved will work under the direction of the teacher. These could include:

- teacher aide
- volunteers
- peers.

Teamwork is important when working with students. Good interpersonal relationships and respect between all members is essential to ensure a successful education program.

All students have varying educational needs. The needs of students with a vision impairment depend on many factors such as the degree of vision, age of onset of eye condition, the student's ability and motivation, and age.

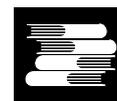
To gain access to the curriculum, additional skills need to be taught to students with a vision impairment. Such skills include braille, keyboarding, and orientation and mobility. Teaching strategies and methods may need to be modified and specialised resources and equipment organised to ensure participation.

The teacher aide should be aware of:

- the student's visual condition/s and any other medical conditions
- how the student uses vision
- low vision aids used
- availability, access and use of appropriate equipment, resources and technology
- support from other sources
- necessary modifications to the learning environment.

## Helpful hint

Your school should have the kit  
*Teaching Students with Disabilities.*



The educational program for students with a vision impairment will be supported by information from eye specialists, such as ophthalmologists and optometrists. Some of these students may require follow-up medical management assisted by school staff.

Generally vision conditions in children are stable but some students may require regular monitoring after diagnosis.

It is important for the teacher aide to be aware of the student's condition and implications. Care should be taken when discussing individual cases to protect sensitive and confidential information.

## Your role

As well as being involved in the ascertainment process and IEP implementation, the teacher aide supports the teacher and the student with a vision impairment in:

- 1 direct support to the student
- 2 preparing the learning/teaching environment
- 3 acquisition and storage of specialist equipment and resources
- 4 organising the maintenance of specialist equipment
- 5 adapting and developing resources.

### ***1 Direct support to the student***

While working as a teacher aide it is important that the student does not become too dependent on you as this could lead to *learned helplessness*.

**Learned helplessness:** This can occur where students' requirements are met by an adult or peer without their having to make an effort. It is in the best interest of students that they become responsible for their own needs and interactions with others and develop the confidence to advocate for themselves.

Teacher aides assist students individually or in small groups. This occurs in a variety of settings, such as:

- classrooms
- withdrawal areas
- the playground
- swimming pool
- taxi duty
- the community (e.g. shopping centre).

The teacher aide works under the direction of the teacher. Programs are regularly monitored and revised. Duties include:

- general supervision
- follow up support
- supervision of practice activities
- attendance at special events.



## GENERAL SUPERVISION

Examples of general supervision include:

- playground
- sport and play
- class work (e.g. care and maintenance of equipment)
- student movement
- examinations.

The teacher aide's observations of students can assist the teacher by:

- gathering information for individual programming
- monitoring time management and organisational skills
- recording study skills
- monitoring environmental conditions
- monitoring functional vision.

Following supervision and observation the teacher aide may be required to discuss the student's progress with the teacher and complete records such as checklists.

**You are asked to supervise students.**

**List five considerations to ensure safety and participation in (a) an indoor activity, and (b) an outdoor activity.**



Activity 3.1

## ***FOLLOW-UP SUPPORT***

While specific programs and training are devised by the support teacher:vision impairment the teacher aide provides much of the follow-up support, such as in:

- early tactile learning
- early reading and writing including braille
- typing
- sighted guide technique
- room familiarisation
- life skills such as dressing, eating, handling utensils, grooming
- monitoring and care of equipment and low vision aids
- use of technologies.

Teachers alone, can not accomplish all that needs to be done to ensure students with a vision impairment can access the range of educational opportunities. Teacher aides have a role in assisting the teacher in achieving this.

## Responses to vision impairment in the learning environment

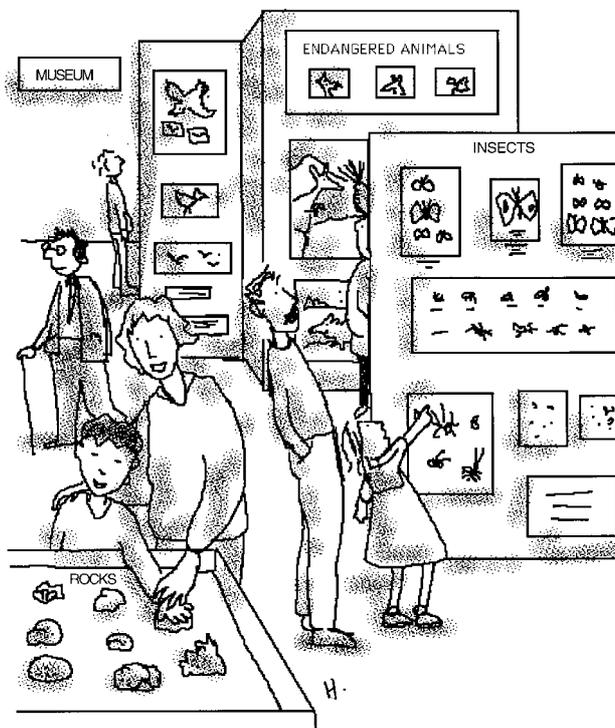
### ***SUPERVISION OF PRACTICE ACTIVITIES***

Many activities in which follow-up support is provided require regular practice. Teacher aides are given responsibility to supervise these activities. Such activities may include:

- keyboard practice
- routine organising of materials in own work area
- writing skills
- care and use of low vision aids
- sports training and practice
- cane use.

### ***ATTENDANCE AT SPECIAL EVENTS***

Teacher aides may be asked to attend special events, such as school camps, excursions and sporting activities. Safety issues are important and should be considered when planning activities. The teacher aide has a role in ensuring safety measures are in place.



## ***2 Preparing the learning/teaching environment***

Teacher aides prepare the learning/teaching environment. This may involve a variety of tasks such as gathering tactile materials for a collage or braille an exam question sheet. Some examples of duties performed by a teacher aide are:

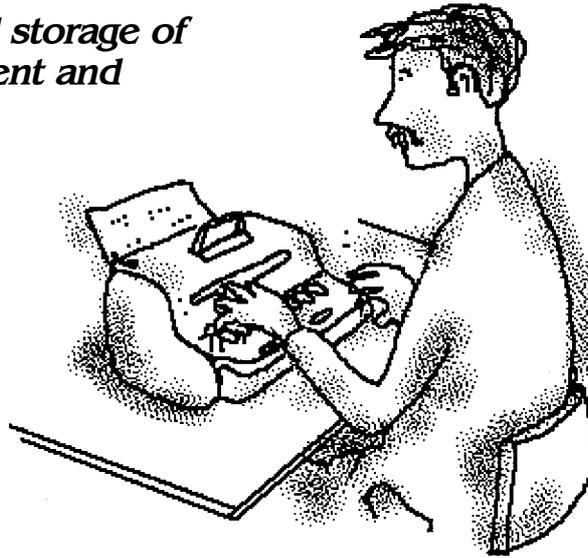
- preparing braille labels for items in classroom
- setting up equipment in the room
- gathering or setting up special resources (e.g. in science or physical education)

- ensuring braille, tactile or large print materials are available
- preparing a consistent and safe environment.

### ***3 Acquisition and storage of specialist equipment and resources***

There have been major developments in technology and resources that assist students with a vision impairment.

The teacher aide needs to be able to use a variety of specialised equipment and materials. Some of the equipment will be specific to braille users while others will be required only by students who can use print.



Braille users can use a range of equipment and resources to read and write braille. This can include a Perkins braille, computer braille software and computer braille embosser, laptop braille computers, braille rulers and protractors, braille paper.

Students who read print may use telescopes, magnifiers, closed circuit television, large print books, dark lined writing pads or slope top desks. Also available for students with vision impairment are computers with speech output, taped texts and four-track tape recorders

It is essential to prepare equipment and resources for students well in advance. The necessary equipment may not be located at your school. While some equipment and resources are held in cluster schools or special education units some schools buy equipment for their own students or borrow from the Low Incidence Unit.

Your duties may be to arrange borrowing and monitoring storage and care of equipment and resources.

## **Helpful Hint**

**Specialised equipment is described and explained in the kit *Teaching Students with Disabilities* which is in every school. See your school teacher-librarian.**

#### ***4 Maintenance of specialist equipment***

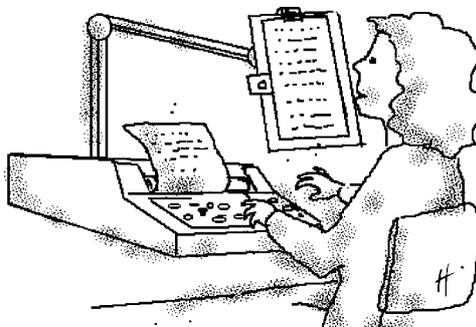
Equipment borrowed by your school may require regular maintenance. Servicing avoids major breakdowns. Vision Impairment Services employs a technician to assist your school in maintenance of some equipment. Some equipment may have to be returned to the supplier for repairs.

You may be required to:

- record the location of equipment in the school
- arrange repair of damaged equipment
- maintain a register of service of equipment
- report damage to borrowed items
- order temporary replacements.

#### ***5 Adaptation and development of resources***

The teacher aide is often responsible for producing or modifying materials to be used by students in the classroom. Students require individual considerations in the preparation of resource materials.



Such material is presented as:

- tactile
- audio
- print (regular and large).

#### **TACTILE**

In preparing materials in these forms, tasks may include:

- converting text into braille
- converting pictures, line drawings, diagrams, and maps into tactile format
- preparing or collating resources including real objects.

You may be required to use:

- computer software and hardware to produce braille and tactile format materials
- computer scanners and embossers for conversion of materials into braille
- a Perkins braille or braille machine
- manual drawing tools which produce raised lines on work sheets
- a thermoform machine to produce copies of worksheets.

(This machine heats special plastic sheets which can reproduce shapes of objects (e.g. knife and fork), braille pages, and three dimensional masters of maps, diagrams etc.

Braille is produced by various methods. Short texts can be done at the school at short notice by the teacher or teacher aide, while longer texts may require some planning or the use of outside agencies.

## **VISION IMPAIRMENT SERVICES (VIS)**

**Low Incidence Unit**

**17 Churchill Street**

**Buranda**

**provides some braille materials to schools.**

### ***Production of tactile books, diagrams and maps and pictures***

Books and kits for younger children have interesting and stimulating illustrations and print styles. These images can not be transferred directly into braille as a tactile form. There are ways of producing suitable tactile illustrations to teach braille users about their world. Producing these resources is an important task for teacher aides as is assisting students in using and interpreting them. VIS has a collection of tactile kits that schools can borrow.

Braille books for older students often have tactile maps and diagrams. Teacher aides work with ST:VIs in producing suitable materials.

Several options are available instead of using a picture. These include:

- using real objects or models
- making textured representations in two dimensions of the picture (e.g. the shape of a kangaroo cut from hide pasted on material that simulates grass)
- describing the picture in written text or verbally
- making tactile representations on thermoform paper.

### **BOOK**

**For more details about making tactile books and kits, refer to *The production of tactile books and kits* available from the Low Incidence Unit.**



## Helpful hint

For more information on learning braille and how to produce braille books, you can contact:

Queensland Braille Writing Association  
507 Ipswich Road, Annerley (Ph: (07) 3848 5257)

or

Low Incidence Unit  
Vision Impairment Services  
17 Churchill Street  
Buranda 4102 (Ph: (07) 3247 3288)

### *Line drawing and diagrams*

These are used in school text books particularly in mathematics, science and study of society and environment.

Maps and diagrams require the production of raised lines or out-lines with explanatory braille text. One printed diagram may require several tactile representations. For example, a geographical map of Queensland may require one tactile map to show the cities another to show the rivers while a third shows the mountain ranges. This process is called *editing*.

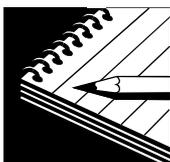
The teacher aide may be required to assist in editing under the teacher's direction. Raised line drawings can be produced in advance of a lesson or composed with the student during a lesson using tactile materials.

Here are some examples of raised line drawings.

- Craft type materials are glued to cardboard to represent the drawing or map. Copies can be made from the original master on thermoform paper.
- A specialised drawing tool (spur wheel) can be used to draw the diagram on braille paper or plastic. A ball point pen can also be used on plastic sheeting. These methods are quick and useful for in-class use. Students can learn to use these materials for drawing.

### *Computer produced diagrams*

There are various computer programs available that help in the production of tactile diagrams. Currently, most computer produced drawings require a sighted person to edit and produce the graphic in its final form. Teacher aides operate these programs.



Activity 3.2

Find a picture book often used by young children, e.g. *Spot* series. List how you could modify this into tactile form.

What materials could you use for the different animals?

Would you use colour?

## **AUDIO**

Audio recording is a way of accessing long text material such as novels or plays. Teacher aides are required to produce taped material for students particularly in upper primary and secondary school. Students, themselves, may tape lessons, record answers, and prepare assignments. In Queensland, taped materials can be borrowed from Vision Impairment Services.

Taped materials can be:

- made at the school (local recording)
- purchased commercially
- borrowed
- prepared by a narrating agency (e.g. Queensland Narrating Service in Brisbane)
- accessed through scanners.

### ***Local recording***

Teacher aides may be requested to narrate passages from journals or novels on to tape. Support teachers:vision impairment provide guidelines on ways to translate difficult passages or diagrams on to tape.

There are specific copyright guidelines to be followed. Refer to the teacher-librarian or advisory visiting teacher.

### **Helpful hints**

- Music or major department stores often have taped stories available.**
- Radio for the Print Handicapped* has a station in every state.**

### ***Text readers***

Computer-based reading technology is used by teachers, teachers aides and students. A text reader scans printed text and converts the information through synthesised voice. Some reading machines are stand-alone while others are attached to a computer. Teacher aides sometimes assist students in using these machines.

## **PRINT**

While most students with low vision can read regular print, some large print material is still required. The ST:VI determines the suitable print size for individual students. Different tasks may require different sizes print.

## Responses to vision impairment in the learning environment

Photocopy enlarging can assist in some reading tasks, such as for examination papers and diagrams.

**There are many ways to adapt print materials** for students with low vision. Some tasks performed by teacher aides include:

- photocopy enlarging
- producing heavy ruled line exercise books with wider spacing to assist and improve writing
- re-writing or typing materials text that was difficult to see in its original form
- modifying the information on a worksheet
- enlargement using a scanner and computer.

### **Scanners**

Scanners are used for producing braille and modifying print size. Scanners copy the page. An optical character recognition program is then used to edit and process the text into braille or enlarged print. This is often a task performed by teacher aides. Training is required to use these machines.

## Summary

Teacher aides perform a very vital role in the delivery of quality educational programs for students with a vision impairment. They help teachers to prepare essential resources that are necessary for individual students. Teacher aides develop specialised skills for working with students with a vision impairment.

A range of professionals and non professionals are involved in the management of the student with a vision impairment.

Teamwork is most important.

The role of the teacher aide in supporting students with a vision impairment includes:

- direct support to the student through supervision, following up lessons, and supervising practice activities
- preparation of the learning/teaching environment by ensuring resources are available when required and making environmental modifications
- acquisition and storage of specialist equipment and resources
- organising the maintenance of specialist equipment
- adaptation or development of resources in braille, tactile, audio or large print formats.

# Glossary

Activities of daily living (ADL)	The routine activities that an individual must be able to perform in order to live independently.
Acuity (visual acuity)	The clarity or sharpness of vision
Adaptive cane	A device pushed in front of a person with a vision impairment to give warning of obstacles in their path.
Adaptive equipment	Any object, such as a talking calculator or a braille ruler, that has been adapted to enable it to be used by a person with vision impairment.
Advisory Visiting Teacher: Vision Impairment (AVT:VI)	A teacher trained in the education of students with vision impairment who provides an itinerant service to students attending their local schools.
Albinism	An inherited condition which causes decreased pigment either in the skin, hair, and eyes or in the eyes alone.
Astigmatism	A refractive error caused by an unequal curve in the cornea requiring corrective lenses.
Audio description	The process whereby a sighted person describes an activity as it occurs. (Example: a theatre performance or sporting event)
Audio format	Presented in an auditory medium such as a tape recording.
Bar magnifier	A device which magnifies a line of print.
Bifocal spectacles	Have lenses with two sections for different visual needs, such as reading and long distance vision.
Binoculars	Used in the classroom for reading the board and for observing activities at a distance – for example, watching sport.
Body image	A mental picture one forms of the physical parts of one's body and their relationship to each other.
Braille	A system of reading and writing in which letters and words are formed by patterns of raised dots based on a cell composed of six dots.
Braille embosser	A computer printer requiring software to produce braille from print on computer braille paper; usually used for producing large volumes of text.
Braille machine	A portable machine used for embossing braille on braille paper.
Braille mathematics equipment	A range of equipment used in mathematics to suit a braille user. The equipment includes braille rulers, braille set squares, braille compasses and braille protractors.
Cane	A straight length of aluminium fitted with a grip and a nylon tip; the device is used in a variety of ways to allow the user to walk safely, efficiently and independently; it acts as a warning device as it contacts obstacles in the intended path of travel of the individual; also known as a long cane.

## Glossary

Cane skills	Techniques when using a cane to assist in moving safely in the environment.
Cataracts	A clouding of the lens in the eye which reduces vision.
Central field	The area of best vision used for viewing fine detail.
Choroid	The layer of the eye between the sclera and retina that provides the blood supply which nourishes the retina.
Closed-circuit television (CCTV)	A device that electronically magnifies text and materials on to a television monitor – used as a reading or viewing aid.
Colour vision defect	The inability to perceive colours. This condition can be hereditary or caused by an eye condition.
Cornea	The transparent protective tissue at the front of the eye which refracts light rays.
Corrective lenses	Lenses prescribed to correct to correct refractive errors of the eye – can be in contact lenses or spectacles.
Dark ruled paper	Paper, either single sheet or in book form, on which the faint ruled lines have been over written with a dark, pen or produced by computer.
Distance vision	The ability to see objects from a distance; distance visual acuity is measured using distance vision test charts such as the Snellen chart.
Duxbury program	A software program that converts print into braille.
Editing for braille	Making adaptations and suggestions on a master page to give directions to the person transcribing the material into braille and tactile form.
Functional vision	The ability to use vision in planning and performing tasks.
Fuser	Equipment which heats special paper to raise drawn or written content on the page.
Galileo	A text reader.
Guide dogs	A dog trained to follow the instructions of the vision impaired owner and assist in safe movement such as road crossings.
Iris	The coloured portion of the eye that expands or contracts to control the amount of light entering the eye through the pupil.
Keyboarding	Efficient use of a typewriter or computer.
Kurzweil reading machine	A text reader with voice output.
Large print	Print that is larger than that used in general texts.
Lens	A transparent structure within the eye that refracts light rays. Changes shape to alter focus from distance to near tasks.
Life skills	Skills used by individuals in day-to-day living; includes dressing, eating, grooming, money recognition and handling, cooking, sewing.
Low vision aids	A range optical and nonoptical devices used to enhance the visual capability of persons with vision impairments.

Macula	The central area of the retina, with a concentration of cones for sharp central vision – the area of best visual acuity responsible for fine visual tasks such as reading.
Macular degeneration	A degenerative disease of the macula that causes a loss of central vision.
Monocular telescope	A hand held magnification aid for one eye used to enlarge objects in the mid to longer range.
Mobility	The ability to move within one’s environment.
Mobility aid	A device used to help in the safe mobility of a student with a vision impairment; e.g. a cane, a guide dog.
Mountbatten Brailier	Equipment used to produce braille; input can be on a qwerty keyboard or braille keyboard.
Myopia (shortsightedness)	A refractive error resulting from an eyeball that is too long; resulting in the light rays from a distant object focusing in front of the retina.
Notetaking	The process of a sighted individual taking notes for use by a student with a vision impairment.
Nystagmus	An involuntary movement of the eyes, which increases with fatigue or stress.
Ophthalmologist	A medical specialist in the medical and surgical care of the eyes.
Optic atrophy	Atrophy of the optic disc resulting from degeneration of the fibres of the optic nerve.
Optic nerve	The sensory nerve of the eye that carries electrical impulses from the eye to the brain.
Optometrist	A professional trained in the measurement of the refraction of the eye; can prescribe corrective lenses and low vision aids.
Orientation	Using the senses to collect and organise information about yourself and your position in the immediate environment.
Orientation and mobility (O&M) specialist	A professional specialising in teaching travel skills to persons with vision impairment.
Peripheral field	The outer part of the visual field.
Photophobia	Light sensitivity.
Pupil	The hole in the center of the iris through which light rays enter the back of the eye.
Queensland Braille Writing Association (QBWA)	A volunteer organisation in Queensland specialising in transcribing printed text into braille.
Queensland Narrating Services (QNS)	A volunteer organisation specialising in recording narrated text.
Reading stand	Equipment that places reading and writing material at a comfortable angle.
Refractive errors	Conditions in which parallel rays of light are not brought to a focus on the retina because of a defect in the shape of the eyeball or the refractive media of the eye.
Retina	The innermost layer of the eye, containing light-sensitive nerve cells.

## Glossary

Scanner	A device that converts a printed image into an electronic format that can be translated to other formats (print or braille).
Sclera	The tough, white, opaque outer covering of the eye that protects the inner contents from most injuries.
Screen enhancement	Software program to enlarge the image on the screen of a computer.
Screen readers	Hardware and software which perform the task of reproducing what is on the screen of the computer into an audible or braille form.
Sewel raised line drawing kit	A kit containing a rubber board with clips, a drawing stylus and clear plastic sheets; used to draw raised lines or diagrams.
Sighted guide techniques	A range of techniques used by a sighted guide to allow safe travel through narrow spaces, on stairs etc by guiding the student who is blind or vision impaired.
Speech synthesiser (Synthetic speech system)	A computer-based system that converts the electronic signals that appear on the screen as text into spoken units.
Stand magnifiers	A magnification aid designed to be placed on the page at a set distance. Some are illuminated.
Stereocopier	Equipment using heat to raise print lines or diagrams as marked swell paper is passed through.
Strabismus (squint)	The failure of two eyes to focus in the same direction; the condition is caused by muscle defect and leads to difficulty with depth perception.
Swell paper	Special chemically treated paper onto which diagrams can be photocopied by conventional photocopiers; the black lines on the swell paper raise up from the surface after going through a fuser or stereocopier to show a tactile version of the original line diagram.
Table games (board games)	Games traditionally played on a board; can be in print or tactile form (e.g. chess, draughts, solitaire, cards, monopoly).
Tactile graphic	A collective name used for a raised form representing a printed form of diagram, graph, map etc.
Tactile story books/kits	Textured books reproducing the printed story book in tactile and textured form; may be in kit form containing real items or in books with the real texture represented in a picture.
Text readers	A computer-based assistive device that converts printed text into speech.
Thermoform	Equipment used to reproduce copies of brailled material or to produce raised reproductions of some materials (e.g. scissors, map models).
Thermoform paper	Specially treated plastic film used only on the thermoform machine.
Tilt-top desks	Desks with a moveable top which tilts work on the desk towards the user.
Tints	Shading applied to windows, lenses in glasses or sunglasses.

Transcription	The process of converting print to braille.
Tunnel vision	Damage to the peripheral retina.
Twin Vision Books	Printed books which have clear or opaque plastic pages containing the braille equivalent of the print interleaved between the printed pages.
Vision Impairment Services (VIS)	Part of the Low Incidence Unit which specialises in services, resources and equipment for students with a vision impairment in Queensland and in supporting the staff who work with these students.
Visual field	The entire field of view of both eyes that can see while looking at a target straight ahead.
Visual system	The pathway along which visual information is passed and processed; includes the eyes, the neural pathways and the areas of the brain responsible for the interpretation of vision.
Vitreous humor (vitreous)	A transparent, clear, jelly-like substance that fills the back portion of the eye between the lens and the retina; it maintains the shape of the eyeball.
Voice software	A variety of computer programs which produces voice output.
Wikki stix	Coloured sticks of thin, pliable material used extensively in mathematics and mobility lessons.

*...continued*

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