UNDERSTANDING CHILDREN WITH SIGHT PROBLEMS

(A *Manual* on *Low* Vision)

By

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ALL INDIA CONFEDERATION OF THE BLIND

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Preface

Services for the blind children have an old history in our country. However very little has been done for children who have residual vision. They are treated as blind for education in both special and general schools. This is primarily due to lack of awareness about their identification, absence of facilities for visual efficiency training and suitable aids.

The present manual has been written to help create an awareness among teachers, para-professionals and parents about the special needs of these children. It helps us to ask ourselves whether what and how we teach and the way in which we organise and manage our classrooms could themselves be a major cause of children's difficulties. What modifications are necessary to ensure fuller curriculum access? Can we identify these children with sight problems in the early school years? An attempt has been made to provide possible answers to these questions. The manual lists appearances and behaviours of these children, specifies activities for training, helps in planning reading, writing and crafts activities etc.. Teachers are provided with guidelines for classroom management and with brief description of aids which facilitate these children's learning.

I am grateful to a number of professionals working in the area of visual impairment in particular Shri A.K. Mittal and Shri J. L. Kaul who have helped me in writing this manual. I would like to put on record the help provided by Mrs. Indu Sharma a Special educator in finalising the manuscript. I am also thankful to the All India Confederation of the Blind for sponsoring this effort.

Anupam Ahuja

Foreword

The task of imparting education to children with visual impairment is of utmost importance in our effort to achieve the goal of an inclusive society where these children are equipped to participate fully in all mainstream activities and look forward to a bright future as citizens of India.

This book which is a manual for teachers, professionals and parents is a valuable input in dealing with the special needs of children with low vision. An exhaustive manual of this kind is the outcome of hard work and dedication on the part of persons associated with it. I would like to express my deep appreciation for the efforts.

I am optimistic that this manual would go a long way to help concerned persons in their task of imparting education and providing services to children with low vision.

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New Delhi.

Introduction

For the past few years, the All India Confederation of the Blind has been engaged in the task of endeavouring to address the needs and concerns of children with low vision, in a coordinated and systematic manner.

The Confederation's concern for these children is in line with its consistent policy of reaching out to the hitherto neglected segments of the visually impaired population in the country. Happily, the Government of India are also, now, beginning to show some appreciation for the needs and problems of low vision persons. The recently enacted legislation titled 'The Persons With Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995", low vision is included as an important area of disability requiring urgent Government attention.

This Confederation has also taken several initiatives for helping children and adults with low vision. It has launched a unique programme called "Low Vision Rehabilitation Project" involving identification and educational inputs for assisting low vision children in regular schools as well as institutions for the blind.

With a view to promoting greater awareness about the educational needs of low vision children and imparting necessary basic orientation to some of their teachers, the Confederation took another important step by convening a week-long National Workshop on Low Vision. The Workshop was conducted by two specialists from Norway deputed by the Norwegian Association of the Blind and Partially Blind. The present manual marks the culmination of this Workshop programme. It is hoped that the Manual

would provide useful and stimulating reading material for both teachers and parents of low vision children. The crucial significance of the Manual lies in the fact that there is a great dearth in the country, at present, of knowledge and information on the education of children with low vision in the form of a concise and brief volume prepared in simple and lucid language.

The Confederation wishes to place on record its sincere gratitude to the help and cooperation received from the following organisations and individuals towards preparing this manual :-

1. **NORWEGIAN ASSOCIATION OF THE BLIND AND PARTIALLY BLIND for providing necessary expertise for the workshop and necessary reference material for the Manual.**

2. **Dr. E.M. Johnson and Vocational Rehabilitation And Training Centre for the Blind, Ludhiana, Punjab, for providing funds for the Workshop.**

3. **Mrs. Anupam Ahuja, Lecturer, N.C.E.RT., New Delhi, for preparing the Manual.**

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ALL INDIA CONFEDERATION
OF THE BLIND.

Chapter-1

Vision, Defects, and their Identification

You may have met children with seeing problems. They are not a homogenous lot. Seeing problems range from total blindness to minor seeing problems. A number of terms are used in connection with loss of sight: blindness, visual handicap, visual impairment, low vision, residual vision, partial sight etc.

Current educational thinking is moving away from the whole concept of labelling children by closely defined characteristics. The emphasis is on the individual needs of children and on the shared aspects of their development and learning. In order to understand the needs and meet them realistically, it however sometimes becomes necessary to use some specialised terminology in order to define pupils who have sight problems.

Before trying to understand the children with sight problems let us peep into an ordinary school and take a look at how work is assigned and organised for children. A dose observation shows that virtually every task involves the use of sight. The curriculum is designed for fully sighted children. Pupils are expected to use close range materials on desks or tables or wooden slates in their laps. They are also expected to look up to the blackboard to copy written text or diagrams. Constant refocusing of their eyes is called for. Visual concentration, tracking and scanning skills need to be exercised. All these skills are brought into play while discriminating between letters of similar shapes, reading written lines, interpreting maps and diagrams, reading mathematical tables, handwriting and in crafts and other practical skills. Varying light conditions and the instructions received for either dose or distant work make different visual demands on children. A teacher needs to carefully understand the needs of the children with sight problems and the demands of each visual task. *In this chapter we look at some terms associated with sight problems and try to understand the needs of these children. We also take a close look at the jiinctioning of the eye, the visual system and the process of identification.*

Effective integration and not simply nominal can be fostered by planning shared learning and play activities for all children. In many cases children with seeing problems are virtually indistinguishable from their classmates in appearance, integrating well and needing only manageable adaptations in order to take part in most school activities. Adaptation (usually

temporary) can facilitate full participation in the curriculum and full access to the school surroundings. The balance between special adaptations and the ordinary provisions of the school needs to be flexible and designed to meet real situations as well as theoretical principles. The range of activities in the school day, the availability of varied learning materials and the opportunities to offer individual programmes can help to meet the needs of both the children with seeing problems and other children. A clear understanding of the needs is essential.

Let us take a close look at some terms associated with sight problems and try to understand the needs of these children. This is to help us become aware of their potential effect in order to meet the educational needs. CAUTION however needs to be exercised to consider each child as an individual and not as a member of a category.

Children who are referred to as blind are completely without vision or have only light perception. These pupils are those who depend on tactile, auditory kinesthatic and dfactory means of learning. They require specialised equipment and additional inputs in their curriculum such as braille, orientation and mobility etc. A careful consideration needs to be given to their language development, concept formation, social interaction and information processing. The teachers working with these children should also find out the age at which total sight loss has taken place. This has important implications in terms of how the children with visual problems interpret their environment.

There are also pupils with some useful vision. Earlier these children were referred to and treated all too often as if they were totally blind. Lately however the misconception and fear that the use of defective vision would make it deteriorate further has been replaced by positive encouragement and training. Practice and definition have moved on gradually. It has been found that it is possible to train children to use their remaining sight more effectively in carrying out some daily living skills, and tasks including mobility. These low vision children should not be confused with the partial sighted.

According to the recent Act for Persons With Disabilities, a person with low vision means "A Person with impairment of visual functioning even after treatment or standard refractive correction but who uses or is potentially capable of using vision for the planning or execution of a task with appropriate assistive device".

In the educational context **low vision** refers to those children who are able to use their vision quite effectively in the near environment under suitable lighting conditions. In many cases these children need to use magnifiers or individually prescribed optical aids in an appropriate working position. These children are not totally blind and should be encouraged to use what vision they have in the learning situation. Care should be taken not to refer to and treat them as blind as this may reduce the likelihood that they may use their vision effectively. They usually face considerable problems with distance vision. Visual enhancement progranunes, clear and highly contrasted learning materials and the use of closed circuit television are highly relevant to these pupils.

Partial sight is a visual loss which is less severe than blindness. **Partially sighted** children are able to carry out many daily living skills and tasks with the help of aids and training. They have useful vision for all school tasks but require adaptations to teaching methods and materials in order to accomplish them. They are usually able to read enlarged print and sometimes ordinary print with the help of suitable magnifiers and lighting.

In connection with both blindness and partial sight visual impairment and visual handicap are terms which are often used. They both mean that there Is a loss of vision without indicating the degree of loss. They are general terms which do not have exact definitions, unlike blindness, partial sight and low vision which can be defined. In this book, the term "Seeing Problems" is used for those children who have remaining vision which can be used for reading print material or can read print material with special aids like magnifiers contrast, better light etc.

Functioning of the Eye

A newborn has a complete visual system, although the eye continues to grow in size until adolescence. At birth however the new horns' vision is blurred and he/she cannot discriminate between foreground and background. However, even at birth the child responds to a source of light and attempts to follow the mother's face. Between one and three months babies are found. focusing the eyes on the hands. There seems to be a readiness in the baby to react keenly to visual stimulation from the first few months of life. How does the eye function?

A close look at the functioning of the eye and the visual system will help us understand the demands children with seeing problems make. The process of seeing is a combination of factors, both physiological and

psychological. The following description explains how if vision is to be fully developed, not only must the eye itself be functioning fully and normally but the brain must be intact and visual perception possible.

The eye is the apparatus for seeing. A simplified diagram (Fig.1) represents cross section of the human eye and indicates the areas that can be affected by disease or trauma. The eye is held in place in a bony structure called the orbit. This protects the eye. Six muscles control the movement of the eye. The outer eye is protected from damage and infection by the conjuctiva and the eyelids, the apparatus which make tears (lacrinal tract). They also keep the cornea moist. The conjuctiva is a thick clear membrane lining the eyelids and the front part of the *eye*, except the cornea.

Light reflected from a object passes through the eye on to the retina and the brain receives the impulses transmitted from the retina via the optic nerve. The retina is a pit or depression surrounded by a small area the yellow spot which provides the acute central vision. It is thick and transparent, easily torn or damaged. Actually the retina can be seen as an extension of the brain to the outside world where it receives light and converts it into nerve impulses, which the brain then translates into vision.

The reflected light first passes through the cornea (the curved transparent outer layer of the eyeball). Behind the retina lies the anterior chamber, filled with aqueous humour. It helps to maintain constant pressure within the eyeball. Light passes through this to the pupil which is the central hole in the iris. The iris is composed of circular muscles. These muscles are visible and give the black, brown and sometimes blue colour to the eye. The iris reacts quickly to changes in light levels. It dilates and contracts, enlarging or decreasing the size of the pupil.

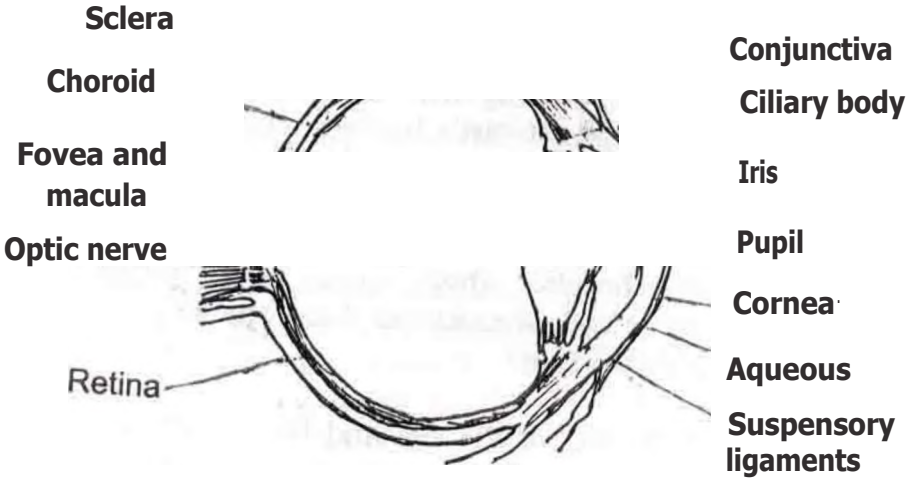

Fig 1 : Cross section of the human eye (simplified diagram)

The lens is a transparent solid body, elliptical in shape enclosed in a capsule and attached to suspensory ligaments with the eye. It lies immediately behind the pupil and completes the refraction of the rays of light as they pass through the posterior chamber which is filled with a jelloid substance the vitreous humour. The retina receives the refracted rays. The retina consists of the inner lining at the back of the eye and is a delicate membrane. It consists of ten different layers. One of the layers contain two types of sensitive cells the rods and cones. Situated in the peripheral area of the retina the rods are activated in lower levels of lighting. The cones are receptive to colour and higher lighting levels. These cells are concentrated in the central area of the retina which is used in the discrimination of fine and sharp images. Visual impulses are transmitted to the visual cortex in the brain via the optic nerve. The impulses from the right field of vision of both eyes are received by the left side of the brain. Impulses from the left side of the field of vision are received by the right side of the brain.

Having understood the functioning of the eye you will agree that it is like a camera. It has the iris and the diaphragm which by widening or narrowing let a balanced amount of light into the eye. The eye also has "film" (the retina) which by means of biochemical pressures registers an image and transforms it into nervous signals. When light beams pass through the optical system of the eye, they are refracted to create an upside down, reduced image on the retina. This refraction mainly takes place in the cornea and the lens. Seeing a distant object demands less refraction force than seeing a close object. The eye flattens the lens by means of the ciliate muscles attached to it, and alternatively returns the lens to its thicker relaxed state by relaxing the ciliate muscles. The process of accommodation opening and closing of the pupil, adaptation, prevents dazzling. It also influences the image sharpness on the retina. In the focal plane the image **is** sharp per definition, but a relatively smaller diaphragm adds to the depth of field, meaning increased image sharpness at any given distance to the focal plane. As mentioned earlier upon reaching the retina, a light beam will trigger a very complex bio-chemical process, thereby inducing a signal in the optical nerve, which then transmits the signal to the brain. Two types of cells are involved in this biochemical process. The cons are responsible for central, sharp vision and the bacilli are responsible for the more **blurred peripheral vision and night vision.**

Visual Defects

Having understood the functioning of the eye, you may be asking yourself why some children have visual difficulties? What are the different types

of visual defects? For your guidance a description of some of the causes of visual disability that can be encountered in school children is given.

The eye is a very sensitive organ. Any disease injury or abnormality may lead to a partial or total loss of vision. There may be a reduction in the field of ability to see detail (visual acuity) or a reduction in the field of vision or in the ability to see the whole picture. Diseases of the eye may result in one or both types of vision loss.

Malfunctions of a visual system may originate in one or more areas of the total visual system. They may occur in the physiological system (the optical system of the eye), physiological and biochemical system (the retina), the neurological system, the perceptual system, the visual cortex and the brain in general.

Let us look at some visual defects that arise because of loss of clear vision, loss of central vision, or loss of peripheral vision. Sometimes the visual field may be reduced or interrupted. In rare cases children may have a combination of these effects also.

Loss of Clear Vision

Loss of clear vision causes blurring and distortion of sight. Some times it also results in the reduction of clear distance vision. Close work may present few difficulties. However, more distant visual tasks such as reading sentences on the blackboard give greater problems.

Loss of Central Vision

You may have come across a child who is able to run about in the playground with confidence but seems unable to discriminate printed letters in his/her reading. Mobility thus causes no problem but reading and fine visual tasks may prove to be very difficult for children with loss of central vision. Disease of and damage to the central area of the retina used to discriminate fine details can give rise to these effects.

Tunnel Vision

Imagine looking through a keyhole. What do you see? A child with a tunnel vision sees things somewhat like this. It results from the loss of vision in the peripheral field. Retinitis Pigmentosa is a hereditary disease that initially causes loss of night vision and peripheral vision and gradually leads

to tunnel vision. No treatment can be applied to any amount of success. Such children may read slowly as the eyes are able to take only one short word or a few letters at one glance. Bumping into objects is common. Badly lit corridors or stairs can be hazardous.

Nystagmus

Visual behaviour can be effected in a number of ways. A spasmodic oscillation of the eye called nystagrnus may cause problems with focusing. The oscillations are usually from side to side but can also be up and down. Often children with nystagmus find their vision more stable if the head is held on one side or slightly askew. When giving activities involving the close use of vision teachers must remember that these children may get tired more easily. Stress and excitement may further aggravate the situation. A balance must be found between the child's ease of vision and the tension fatigue and other possible effects of the bad posture. Scanning along a line or print can also be affected because of the visual field being reduced or interrupted. The child should sit near the blackboard so that he/ she may be enabled to see demonstration of materials presented.

Albinism

You may have seen children with very fair hair, paler skin and pinkish appearance of the eyes. It is an inherited condition involving the loss of pigment in the hair, skin and eyes. These children find it difficult to move from a shaded interior into bright sunlight outside. They may be others who may be nervous when coming indoors after being in brighter light outside. Photophobic children sensitive to bright light can find the bright sun also quite distressing. Any form of glare causes difficulty.

Such children should be seated near a window and the classroom levels of lighting adapted to suit their needs. These children can be near sighted or far sighted and need glasses to help with their distance vision. The glasses may riot help their reading distance but they may be able to read adequately by holding their books at closer than normal distance. Associated postural problems may be taken care of by using an appropriate book stand.

Aniridia

Some children have eyes which appear dark in colour. The pupil is very large. The muscles which open and reduce the pupil and the iris are lacking.

Tinted glasses, contact lenses or painted contact lenses with only a small clear pupil may make the child more comfortable. The visual performance will also improve.

Cataract

Children with cataract have their lens cloudy and opaque. The cloudy lens prevents the passage of the rays of light on to the retina. Many such children will need surgery. They will have to use strong spectacles or contact lenses. Because the eye is unable to change its focus bifocal spectacles are required. Levels of lighting should be assessed for each child and a good contrast of print on paper will need to be provided. The size of print should be checked and the use of appropriate low vision aids or closed circuit television may be appropriate. The teacher should consider the possibility that the strong glasses needed by these children may give an odd appearance to the eyes and other children may tease them. These children may see well directly through the glasses but there may be difficulties with the peripheral vision and mobility.

Dislocation of the lens

Some children can have partially dislocated lenses. There is blurred distance vision. The near vision is sometimes good depending upon the type of dislocation. Physical activities need to be monitored as sudden body contact or jarring of the head can bring about further dislocation.

Corneal Ulcers & Scars

Infections and accidents can result in scarring and ulceration. Children with these conditions will be averse to glare and have severely reduced vision in bright sunlight.

Glucoma

Sometimes, an elevated pressure can develop inside the eye. It can lead to loss of vision. The pressure may develop acutely or over an expanded time. There is a faulty drainage of the aqueous. The cornea may become cloudy and refractive errors develop because of the altered shape of the eye and abnormal position of the lens. It can be treated medically or surgically.

Hamianopia

Messages from the right hand field of vision of both eyes are received by the left hand side of the brain. Similarly messages from left hand field of vision of both eyes are transmitted to the right side of the brain. Damage to one side of the brain due to a tumour or trauma can cause a loss in the field of vision on the other side.

Long sightedness / Far-sightedness

The most common refractional disorder is probably long sightedness (hypermethropia) where the image is created behind the retina thus demanding extra refraction by means of adding a convex lens. Children often have accommodative resources that completely eliminate the need for corrective glasses in the cases of slight hypermethropia that are seen during the first years of school.

Hypermetropia caused squint. These children are often reluctant to do much reading and writing and may also suffer from headaches. Such children will have good remaining vision but mobility and associated activities will be affected. Reading too will be difficult. Children with left sided hemianopia will find it difficult to spot the beginning of a line of print. Children with right sided field loss will be looking ahead into space. Neither glasses nor enlargement of print prove useful in this condition. Teachers should help these children to move head and eyes in the right manner to compensate for the. field loss.

Nearsightedness/short-sigh ted ness

Common is also near sightedness (myopia) where the image is created before the light beams reach the retina. It is corrected by means of a conclave lens. These children may hold books very close to the eyes. Because of poor distance vision these children may miss much of what is going on in the classroom and seem 'out of step' with the rest of the class. They may 'opt out' of physical education and games as they pose difficulties for these children.

Identifying Children with Seeing Problems

Having read a description of some of the different kinds of seeing problems that can be encountered by school children, let us try to see how we can identify them in the early school years.

Children use their vision in different ways, both in formal and informal situations within and outside the classroom. Observant teachers can help identify visual difficulties by being alert to the ways in which such problems manifest themselves. The unusual position/distance/angle while working, frowning, squinting or facial grimaces are some physical indications that may appear because of defective vision. Some children may show an aversion to bright light, cover one eye with the hand or close it or may complain of headache or dizziness while trying to read.

A close observation of how children manage school tasks such as unexplained delays in reading, a short attention span in visual tasks, letters with similar shape causing confusion, reversing letters, poor hand eye co-ordination, marking the place with the finger continuously when reading also point at difficulties in sight.

The play behaviour can also indicate possible visual problems. Some children may be reluctant to take part in physical activities, appear clumsy and exhibit a tendency to bump into objects. A poor balance and fear of light, walking hesitatingly or hovering on the edge of the playground rather than actively playing may also be observed.

Observing the appearance of the eye and noting the complaints associated with the use of the eye and their seeing behaviour help in identifying children with visual problems. Care should be taken to see that behaviour should not be considered in isolation for taking decisions about identification. The following checklists provide items for observation to identifying such children. Some of the behaviours listed in the checklist however also appear individually in children with other disabilities and even in non disabled children.

*6.	Does the child lose or skip her/his place while: reading? writing?	 Yes/No Yes/No
*7.	Does the child mom head or book instead of eyes while: reading?	Yes/No
*8.	Does the child become fatigued while: reading? writing	 Yes/No Yes/No
*9.	Does the child use a finger as line marker to guide the eyes while reading?	Yes/No
*10.	Does the child close/cover one eye when reading?	Yes/No
*11.	Does the child face problems in pointing to familiar objects or pictures in books?	Yes/ No
*12.	Does the child have difficulty in pointing to the title of a lesson or lines in bold print in books?	Yes/No
*13.	Is the child unable to get information from the black board even when the teacher does not speak while writing?	Yes/No
14.	Does the child request the teacher to change his/her seat in order to see the black board clearly?	Yes/No
15.	When the name of a child is called out by the teacher or a classmate, can he/she locate the caller (look in the directior of the caller)?	Yes/No
* 16.	Does the child avoid going near windows in the classroom?	Yes/No
*17.	Does the child face problems in location of his/her friends while playing?	Yes/No
18.	Does the child hesitate in moving around in bright light?	Yes/No

Note :

*If you observe any complaint/complaints associated with the appearance and use of the eyes along with any eight seeing behaviours out of eighteen ones as 'yes', the child needs functional assessment for his/her vision.

Have you observed a child with such observable characteristics in your classroom or play-field? Are you wondering how you can help these children along with others? The next three chapters will provide you guidelines for helping such children. Go through the ideas carefully and adapt and innovate. Remember we want to only suggest ideas not prescribe solutions.

CHECKLIST FOR IDENTIFYING CHILDREN WITH REMAINING SIGHT IN EARLY YEARS (BELOW FOUR YEARS)

	a) Do eyes of the child appear to be in constant motion and:	
	b) have a squint in one eye?	Yes/No
	c) have a squint in both eyes (cross eyed)?	Yes/No
	d) be rubbed frequently?	Yes/No
2.	**Does the child turn towards the source of light for** example a **bulb, lamp, candle?**	**Yes/No**
4.	**Does the child move his/her eyes when the source of light moves back to and forth?**	**Yes/No**
5.	**Does the child show confusion in recognising people in his/her environment?**	Yes/No
6.	**Does the child blink when a hand is moved in front of** his/her face?	Yes/No
7.	Can **a child make out a smile, frown, surprise or anger on faces of other children/adults?**	Yes/No
8.	**Can the child imitate actions of other children/adults?**	Yes/No
9.	**Does the child face problems in counting fingers?**	Yes/ No
10.	Is **the child able to put up an indicated number** of fingers?	Yes/No
11.	**Can the child point to his/her body parts when asked to** do so?	Yes/No
12.	Does **the child face problems in ball play that is in:**	
	a) rolling?	Yes/No
	b) bouncing?	Yes/No
	c) throwing?	Yes/No
	d) catching?	Yes/No
13.	Does **the child face difficulty in discriminating:**	
	a) shapes?	Yes/No
	b) sizes?	Yes/No
	c) textures?	Yes/No
14.	**Does the child face any difficulty in reaching** objects?	Yes/No
15.	**Does the child maintain eye contact with :**	
	objects?	Yes/No
	Persons when talking?	Yes/No
16.	**Does the child while moving, use his/her:**	
	vision?	
	Sense of touch?	
17.	Does **the child face problem in locating dropped objects** such **as toy, spoon, etc.?**	Yes/No
18.	**Does the child complain about glare?**	Yes/No
19.	Does the **child sit very close to the television while** watching it?	Yes/No

CHAPTER 2

Using Remaining Sight Effectively

Our country has a large population of people with visual disabilities. A study conducted a few years back (by Dr. Madan Mohan and WHO) estimated the number of blind persons at 12 million and those with low vision at 28.56 million. Thus in a population of an odd 900 million about 40 million people constituting about 3.5% of the population suffer from some degree of visual impairment.

Total blindness is on the decrease. For every blind child there are five children with remaining sight. The special needs of these children with limited sight need to be brought in focus. This is a cause of concern and dissatisfaction for many teachers like you in the schools for the blind and in integrated schools.

We attempt to address your real concern in changing this situation. Like many of you we firmly believe that they can be helped with a strong will and well directed efforts. Special aids and knowledge are now available to provide such help. It is important however to reiterate and to take on board the fact that these children with unusual sight do not form a homogenous group, but rather include a great variety of seeing problem. In this chapter we focus on training in the use of remaining sight in the early years of development and during the school years.

Early years

Let us begin by taking a close look at the early years of development. These years are most crucial for sensory stimulation and perceptual development of children with seeing problems. Well planned functional sight training and encouragement to look and move at this time improves the chances for them to use their vision meaningfully. Looking causes the children to use eye muscles to try to focus, refocus and fixate on shapes, colours and patterns. Designs, patterns, pictures with faces and bright objects could be hung around the living place. Bright/mixed colours or black and white have been found to be most suitable and visible. When the child is awake light reflecting objects easily available in the environment should be dangled and moved back and forth in front of the eyes and close to the face. Such activities stimulate looking.

The following tips have been found to be effective for planning functional sight training programmes for these children at an early age.

- **Encourage eyes to follow objects by moving things back and forth slowly. Children can be helped to reach out to objects and bring them close to the face. Immediate success may not be apparent. Even if there is little response, continue the stimulation several times a day using different objects. Looking may begin to be satisfying when there is something interesting colourful and meaningful to see.**

- **The motor system should begin co-ordinating with the sight system. Assist the child who is beginning to move to reach, crawl or move close to objects.**

- **Provide plenty of freedom to move, explore, look and touch simultaneously. Guard against being overprotective. Vision begins to develop more consistently when toddlers provide some of their own stimulation by moving and looking. Initially children with some specific seeing problems may show frequent falling and little attention to see things. Auditory clues or use of the word look' etc. help children in continuing to notice things.**

- **Outdoor exploration should also be encouraged. Limited sight is no reason to restrict movement. Bumps, bruises and minor abrasions are part of all young children's lives including those with some sight difficulty.**

- **By conversing and encouraging child to child interactions invite attention to interesting things. Guard against the possibility of the child missing things seen only by moving close and touching. Focus on the need to search visually in order to foster learning to see.**

- **Overprotection limits exploration and movement activities and slows development of important functional skills. Teach young children that there is something to see and how to look. Looking is needed by children with limited sight to fill the brain with visual memories. Help them to enjoy seeing by making looking and discovering a game which is fun to play.**

- **Children with seeing problems may not be able to have the same exposure to a variety of stimuli as compared to their sighted peers. Sometimes the physical use of the environment and the ability to interact with it may also be limited.**

• Point to pictures of familiar things on pages in books and magazines. Bring them close to the eyes of young children to encourage looking.

School years

Children with seeing problems can be helped to use the remaining sight to do their personal work, move around, read and write. Experiences for using the remaining sight appropriately through the tactile and kinaesthetic senses etc. become important. Consider for example birds chirping in a cage. From hearing the chirp it is difficult if not impossible to count the birds. You might have heard of children who do develop sophisticated levels of hearing and touch. There exists however, considerable individual variations in these areas of competence too. All efforts should be made by adults to help children make optimum use of their remaining sight. Vision helps to integrate the partial or fragmented information transmitted through the other senses and is thus a unifying sense.

With *training,* the ability to use their limited sight can be improved. This type of training is called functional training for the use of remaining sight. It enriches visual experiences of an individual. Experiences based on activities involving *visual curiosity, exploration* by the child coupled with *verbal explanation, recall through recognition, interpretation, etc.* can form part of such a training programme. Let us take a close look at each component.

Visual Curiosity

Functional use of the remaining sight to a large extent depends upon its use. It is important to develop visual curiosity in the child. It forms the basis for other activities relating to the use of remaining sight. Several stimuli could be presented in the environment of the child to provide visual learning experience which focus on the development of visual curiosity. The activities can be planned by the teacher within the classroom as well as outside the classroom. It is important to provide initially activities in which the child experiences success. It will sustain interest of the child in the use of remaining sight.

Exploration

Children begin with exploring the environment, objects and their body parts. The child on first entry to the classroom should be provided opportunities to explore and identify its features. She/he should try to know where the

door is. window, table etc. is and what can be seen from the window and the door.

Objects

Children examine the size, shape, texture, colour of the object/objects and try manipulation. For example, children handle and manipulate play-way material and utility items at home. Visually exploring concrete materials in the environment and real life objects around them should precede introduction of artificial material representation of actual things.

Body Parts

Children recognise their body parts and their movements in different activities. The recognition of body parts as well as movements and gestures of other persons should also be provided. Most of the free exploration is self initiated. Because of limited sight, some of these children do not perceive all features of the environment, objects or persons. Thus by verbal explanation from others children may be able to describe them verbally. But they might not have seen or experienced all features in concrete form because of limited vision. Thus teachers by prompting and encouraging can help these children to observe the features and describe them along with concrete experiences.

Recall through recognition

Once children with remaining sight have recognised objects and persons, they should be in a position to recall through recognition. Familiar objects can be mixed and the children asked to pick out a particular object. Children can also be asked to focus their eyes on an object in front of them. The object can be removed and the child asked to describe it.

Interpretation

Children after seeing the objects/persons should give their perception of the features. They should be in a position to relate objects in the environment, find out similarities/differences and be able to describe their features in their own words. For example, they can be given different parts of a doll or any other object which the child has already seen and played with or used. The child may be asked to reassemble and tell what it is? Similarly, for older children age appropriate exercises can be given.

Pre reading, writing and numeracy skills

The success of any activity depends on how well its preparation has been done. Reading and writing activities also require careful preparation as children with sight problems are likely to be deprived of much incidental pre reading experiences as compared to their peers. Let us look at the type of exposures children living in urban areas can get. They may be exposed to words on poster hoardings, labels on food packets, television advertisements which are often accompanied by pictures which illustrate meaning and lots more. How much learning takes place this way is difficult to quantify. However, what is important for teachers to consider is that there is often need to offer enriching compensatory experiences to the children with seeing problem. It is not the lack of ability to or potential but enriching compensatory experiences that pose initial difficulties when print is begun

Reading readiness activities should be carefully planned to prepare the child to learn the skill of reading and reduce the effort in distinguishing the details of varied reading materials. The management of lighting according to individual needs, adjustment of size or type, spacing, quality of paper and use of illustrations (combining print and pictures) should also form frequently assessable components of readiness programmes.

Teachers working with these children need to plan structured pre reading activities with a clear presentation at the early stages of schooling. As this is done each child's learning situation will need to be approached.

The teachers will need to ask: -

- **Is the child working in a suitable position in terms of his/her visual functioning?**
- **Is the seating arrangement appropriate in relation to lighting in the room?**
- **Is the blackboard surface in good condition or can a coat of blackboard paint improve visibility?**
- **Are the necessary books/low vision aids and other materials/equipments readily accessible?**
- **Does the reading material (books/printed material) have a good colour contrast, spaced out properly and have sufficiently dark letters etc.?**
- **Is the child making appropriate use of visual aids (spectacles/ magnifiers/any other low vision aid)?**

Visual efficiency training programme designed for children with seeing problems in integrated programmes and schools for the blind can be of great benefit. Nevertheless, teachers need to remember that after a child with seeing problems has gone through such a training programme he/she may still not be able to pick up a book and begin to read visually. A transition period should follow in which the idea that reading is fun and purposeful should be fostered by appropriate activities. This is essential to guard against the child with visual problems considering reading as simply recognition of words. These children need to be prepared by teachers to move into the medium of printed books.

Pre reading skills help to develop in children the skills of:

- Handling and manipulating books.
- Identifying front, back top, and bottom of books.
- Holding the books at an appropriate and suitable distance from the eyes.
- Locating specifics (e.g. something in a picture, a number on a page etc.).
- Tu ning pages.

Activities for reading readiness should promote *visual discrimination, sound discrimination* and help develop *observation skills, memory, sequential thinking, class ation* of objects and vocabulary. Children should be encouraged in general ways to use any sight they have as actively as possible. Searching visually for different features in objects and pictures by looking attentively should be encouraged. Interesting displays and materials should be placed where children can get near to them. During story telling sessions, for example children with sight problems can be asked to sit near the teacher to have the chance to gaze at pictures etc.

The teachers can plan appropriate activities like matching similar objects, funding out one picture/object different from a set of identical pictures/ objects, picture conversation. etc. Educational aids/activity sheets to suit the needs of children can be prepared by teachers. A group of teachers can work together to meet this need Games can also be planned to help children concentrate and identify beginning and end sounds of words. Opportunities can also be provided to help listen and discriminate

between different sounds like noise of transport, voices of animals, birds, musical instruments and other sounds in the environment. Various sounds of different musical instruments can also be introduced.

Before a child with seeing problems learns to read and write, it is necessary for him to learn to observe similarities and differences of forms and shapes of objects. This skill is needed to distinguish minute differences between certain letters like a/a, q/q, b/d, e/c, etc. Some words also have very subtle differences which can cause a problem while reading. Teachers should first give them such activities which help them to differentiate between colours, shapes etc., before sound and word discrimination can be introduced. Such exercises will make it easier for the child to discriminate the sounds and shapes of different alphabets.

Activities Involving arranging pictures (bold and with proper colour contrast) help in developing sequential thinking. Similar activities involving completion of sentences conversing using picture cards etc. help to promote vocabulary.

In the primary classes many activities involve the need to master new skills and manage equipment materials and processes. The inability to manage practical skills at an appropriate stage can lead to problems more difficult to handle later as more complex and sophisticated levels of manual dexterity become necessary. Curricular areas like science, crafts, home science etc. include practical activities which require these skills.

Learning may be time consuming for both the teacher and children in the early years but the investment in time and practice are needed. Many of these will require the teacher to show and sometimes guide the child's hand into appropriate grasp, (while holding scissors or crayons etc.). Demonstrations at close range may be required at distances most suitable for the children.

Number Readiness

In the early stage children with seeing problems, depending on the type of visual problem may also have difficulties in understanding basic concepts of shape, size, form, pattern and in classification and sedation. The language of numeracy may also be poorly understood. For example, can the number two mean two books, two birds, two trees can be difficult to interpret. Similarly properties such as large/small, different, more/less etc. can also pose difficulties. The cause is usually limited sensory experiences. A structured set of experiences and early attempts at computation will need

to be provided with concrete examples along with demonstrations of the concepts used.

Specific activities/experiences related to number work like classification/ sorting, sequential thinking, problem solving are necessary to plan for before teaching numbers. The teachers need to also provide a variety of activities to help practice and clarify pre number concepts such as big-small, tall-short, thick-thin, far-near, heavy-light, long-short, wide-narrow, left-right, high-low etc.

Writing Readiness

For writing readiness carefully selected eye-hand co-ordination activities should be provided. These can include clay modelling, colouring within well marked spaces/ pictures drawing on floor/ slates etc. Playing with blocks (wooden/plastic) in different contrasting colours or black and white also help in the developing of co-ordination skills. Different types of tracing activities and copying forms, joining dots, drawing zigzag/ straight lines can also be given.

Some children with seeing problems can have poor fine motor co-ordination and this can be developed and improved through the manipulation of tools and craft materials. Careful teaching both in terms of safety and competence are required. One to one demonstration may be needed in the use of scissors, handling crayons/ paint brushes etc. Crafts that might initially not seem suitable for pupils with seeing problems, with practice gradually become manageable and enjoyable. Local crafts such as wood carving, wire mesh, clay sculpture or leather craft etc. can be encouraged.

Some children with myopia excel in fine line drawings and produce graphic work of high standard. These children can be highly motivated to use their vision and to work for increasing lengths of time. Strongly coloured crayons, poster paints and felt tip pens can be used for drawing.

Reading and Writing

Imagine a group of children with seeing problems in an integrated setting. Rahul has problems with distance vision and therefore finds blackboard work difficult. Jasmin has blurred vision because of a soft cataract and Gopal is an albino whose photo-phobia requires careful monitoring of light. Ahmed has reduced visual field and a deprived social background; with very little conversation because both his parents suffer from hearing loss. Though these children have poor visual functioning the case of Ahmed illustrates that it is unlikely to be the only factor involved in potential reading difficulty. All these children need to develop skills in visual perception, in language and movement in order to use printed reading material.

It is understandable that teachers may approach the teaching of reading to these children with some apprehension. All the odds seem apparently to be set against the chances of such pupils reading fluently and easily. They may need to place material very close to their eyes. Proper lighting, use of magnifiers, or other suitable low vision aids which may reduce the span of letters or words visible at one glance may be required. All these factors do not mean that teachers in ordinary schools have negative expectations with regard to the reading attainment of their children. The challenges posed are interesting and will demand attention to the individual needs of pupils.

Let us begin by understanding what is reading. The reading process is a complex interaction between sense functions, sensory-motoric behaviour and the brains interpretation of symbolic information received through the senses. The degree and extent of creative interpretation and involvement in the reading material demands therefore that as far as possible the routines of the reading process should be automatic or reflex reactions. Children can have difficulty in reading because of various reasons e.g. dyslexia, brain damage, bi-lingualism , problems in sight and visual co-ordination etc.

All children including those with seeing problems need to develop skills in visual perception, in language and movement in order to use printed material. The essential aspects of reading are abilities to distinguish figure from background, discriminating shapes, visual searching and scanning. The reading scheme that the teacher finds useful for the whole class is likely to be equally well suited to the needs of the children with seeing problems. It is the presentation and management of the reading material which needs special attention for these children. A flexible approach is required in order to meet individual needs as there are some challenges

faced in the management of print that arise from the nature of the seeing problem or the use of optical aids used for optical correction and magnification.

Visual readers use groups of words as information units. Very often the maximum amount of time that is needed in order to identify whole words or even phrases is no longer than that required to identify single letters. For children with a restricted visual field or those using high magnification the area visible at one glance is reduced. Thus the capacity to perceive whole words and phrases as patterns instantaneously and to search and scan along in order to predict becomes difficult.

READING AND WRITING ACTIVITIES

General Guidelines

- **The children with limited sight get fatigued sooner than other children. As they tire soon, they may lose their place, skip lines and/or read less well as compared to others. Children may be provided a break or change of activity before reading work is restarted.**

- **Help the child to read with the help of suitable magnifiers.**

- **Proceed from letter, to words, to sentences.**

- **Letters and words should be properly spaced avoiding too much closeness or separation.**

- **In English, avoid flashy cursive letter writing. In Hindi and other Indian languages, the matras and anuswars need to be put quite distinctly.**

- **Punctuation should be used.**

- **When the teacher writes on the blackboard or in exercise books of the child, it should be large enough to be read by the child. As a child's functional sight improves, its size may be reduced.**

- **The enlargement can also be done through the use of magnifiers. The teacher can try different magnifiers and help the child to select the one which best facilitates his/her reading.**

- **Encourage children to maintain a personal diary of all her/his visual experiences. For example, the child may record whatever she/he has seen in the garden or in a visit to the zoo.**

- **Encourage children who read slowly how to spot key words and phrases in sentences.**

- **The child can be helped to read by improving light conditions. He/ she can be seated near the window or door from where sufficient light is available.**

- Contrast also helps in increasing efficiency of reading for the children with limited light. Black print on yellow surface or vice-versa or black print on white surface or vice-versa without glare can also be helpful.

- The children can be helped in reading, by reducing the distance between the eye and the reading material. A suitable stand can be made available from locally available material to reduce fatigue effect.

- The teacher can prepare large print material using reed pens.

- In language, teaching, we normally start teaching reading of words/ sentences to make it meaningful. But children with limited sight find it difficult to read a sentence and even a word. For such children, teaching of reading may have to be started from letters.

Reading

A) Activities to Promote Letter Recognition

- Introduce letters using flash cards. The letter should be in print which is large enough for the child to read in proper colour contrast.

- Introduce letters in pairs and present them on flash cards in proper colour contrast Mix the cards. Ask the child to pick out letters which are the same.

- Encourage the children to note different lines and curves in the letters. Ask them to point out similarities and differences.

- Children can be given exercises in cutting, pasting, colouring the bold and enlarged prints. Ensure a proper colour contrast.

- When the teacher is satisfied with the child's performance in recognition of letters, ask the child to pick up the letter and say it aloud.

- Children can also be asked to pick out a letter called out from a chart.

- Try out different games involving looking and seeing exercises on worksheet with specific directions (for example "search out all the yellow/white letters". The base can be black).

- Use simple letters and ask the child to pick out the unlike letter.

- **Make worksheets in which the child can match similar letters.**

- **Make boxes with letters written on them. Make cards with same letters as those written on the boxes. Mix up the cards. Ask children to sort out and put the card in the appropriate box.**

- **Make worksheets matching upper and lower case letters in English.**

B) Activities to promote discrimination, recognition and identification of Individual word symbols.

- **Encourage the child to join letters to make words. This can be done by giving flash cards of the letters separately and showing him/her the word formed by joining the letters on another flash card. Let the child form the same word by joining the letters. Lastly, show the child the picture of the word formed.**

- **Give exercises of circling the letters similar to those used in words.**

- **Children may be given exercises in locating missing letters in meaningful words. Picture clues can also be given. They can also be given simple puzzles with pictorial clues and asked to write the missing letter in the card.**

- **Use pictures of objects the child can easily recognise and make cards. Write letters of the words of the objects on separate cards. Ask the child to match the picture and the word card.**

- **The teacher can also make worksheets and ask the children to match similar words.**

- **Ask children to cut big, bold, colourful pictures from old magazines/ newspapers, paste and label them.**

- **Make cards or use the blackboard and write action words such as jump, run, close your eyes, clap your hands, sit, etc. Ask children to choose and act out the words.**

- **Use simple cards and ask the child to match words, with one letter variation. Present words of known objects or actions unlike in configuration/ length and letters for identification, making and discrimination activities.**

- **Make children memories poems/songs with actions in groups. Ask them to read and recite. Children can read more from memory and do not have to concentrate on each word. This also helps to reduce fatigue.**

- **Ask the child to draw and paint whatever she/he wishes to. Ask him/her to talk about it. The teacher can write below the picture what the child draws. Let the child read what the teacher writes.**

- **Ask children to talk about group/individual stories of their friends, family etc. The teacher writes as the children relate. Ask the children to draw pictures about it and read it.**

- **The teacher can make flash cards of words taken from the story. Ask children to match the flash cards with those in the story. The cards may also be used to build a sentence.**

- **Make a sentence and show a picture showing what is written. Let the child match them.**

- **Give words to the child. Ask him/her to construct sentences using them. A flannel board and words on flash cards that stick on the board can be used, if available.**

- **Build sentences to read from known words.**

  For example : I can run.

  I can jump.

  I can eat.

  I can sing.

- **Similarly, do related activities or games on worksheets. For example, give the child blanks to fill up with picture cards.**

  I am a.....(Boy/Girl).

  It is a ..... (Ball/Dog).

- **The children can be asked to match sentences with the relevant pictures**

  For examples: It is a ball.

  It is a car.

  It is a dog.

  It is a house.

- **Narrate stories using sequences of flash cards and put them on the wall/blackboard/ chart as you go on. Ask children to listen carefully. Ask questions at the end.**

- **Children with seeing problems read slowly. Train the child to spot key words, phrases or sentences. Aid reading skill of the children by providing line markers, reading windows, etc.**

- **Encourage children to avoid sub-vocalisation which concentrates attention on single words and parts of words rather than ideas expressed.**

Writing

Activities to promote Writing Skill

- Thicker, wider, bold and bright lines are better to start with, especially when writing in squares is involved. Gradually narrow the squares.
- Use raised desk/adjusting reading wooden plank.
- Give exercise in copying the designs and overlapping certain designs.
- Ask children to copy the type of strokes used in English and Hindi.
- Colouring and tracing letters help to make the child aware of boundaries and forms in writing.
- Felt pens, reed pens of different sizes can be used for writing. Crayons can also be used.
- Pencils and ball pens should not be used for writing initially. Because of their thin impressions, it is difficult for these children to read their own handwriting.
- Large size notebooks as used in drawing are more suitable than usual notebooks or loose papers.
- As the writing load in schools increases, these children can shift to typing if a typewriter is available
- Sometimes children may not be able to read their own handwriting. This should not be an issue and they need not he compelled to do so.

How to choose books and prepare reading material?

- Black and blue ink are the favourite colours among children with limited sight.
- White paper and black ink provide maximum contrast and visibility.
- Avoid use of coloured ink and strongly coloured paper as it will be too glaring.

- **The paper should be dull and non glare in finish.**
- **Too much and too little spacing between letters, words and lines adversely affects readability.**
- **Individual letters should not be too think or too thick.**
- **Paper with heavy lines is not a good writing surface for children with remaining sight. A clear blue or green lined paper is most preferable.**

Increasing Reading and Writing Efficiency

We all realise that the visual performance of children with seeing problems is not at the same level as that of other children in the classroom. However, training in visual efficiency can improve performance. What does this mean? Visual efficiency training means simply training in what to look at and how to Interpret what he/she sees.

It is well understood by many teachers like you that the immediate environment of the children with seeing problems must be made visually stimulating. We will all agree that all children (blind, partially sighted, low vision or fully sighted) need to be made aware of the world in which they live and be encouraged to explore it. A few children can do it by tactual stimulation while others only by visual stimulation. This applies to all age groups.

The adults involved in providing suitable training to children with seeing problems should ensure that he/she has:

- Adequate knowledge about the performance on the tasks by other children in the integrated class.
- The necessary material required provided at hand (all material need not be shown to the child at one time).
- The required place where training can be carried out without too much distraction.
- The ability to draw inferences about the child's ability/ performance objectively without any bias.
- Proper lighting arrangements for reasonably good visual functioning.
- Provided an appropriate visual distance for the child.
- Provide a non reflective and contrasting background.
- Time and patience. Some children may take more time to adjust, co-operate and build a comfortable relationship.

Most children at the primary level are familiar with pictures of people, animals, plants and objects from their immediate environment. Though these things are familiar, yet many children with **seeing** problems may have problems at the early stages with the identification of what is on the pages. Usually these children are not used to looking at pictures. Even many full **sighted children studying with them in integrated schools may not have developed the skills for scanning large pictures. It is hoped that working with the following activities suggested for visual efficiency training will not only help in solving or at least decreasing the problems in scanning of those with visual problems but all children.**

Teachers can work out loose worksheets for their pupils using ideas from samples (Appendix-I) and also make additional materials according to suggestions given. The activities should be planned in a particular sequence. The principle *from* ***near to far and*** *from know to unknown* should be applied. Initially the cognitive aspect can be kept simple and the visual discrimination aspect the focus. Gradually, however, the visual discrimination can be made easier as the cognitive difficulty is increased. One theme can follow another.

All the suggested exercises materials, instruction and advise must be adapted to individual needs. This is especially important when working with the low vision children. Such activities must be done on a one-to-one basis. These activities should be used as a base to build on and a guide to follow and explore new ways of dealing with these children. Most of the activities suggested in this chapter are designed in such a way that teachers in the primary classes of an integrated schools or a school for the blind can easily conduct them. The incorporation of these activities into the curriculum will help all children and should thus cause no difficulty.

Each set of worksheets has been prepared with as specific aim in mind. Instructions for the teachers have also been delineated to help them ensure that the learner really behaves in the desired way by doing what he/she is asked to do. Materials for use and steps to be followed give ideas as to how the work could be carried out (refer Appendix-I).

Functional training of remaining sight can be facilitated in children with seeing problems by also providing varied activities in the following areas: -

Visual *Discrimination*

1. Discrimination of three dimensional objects

a. Train the child to name familiar objects within his/her environment. The objects should, as far as possible, have a non glare finish and should not be too large either. Object such as a cup, plate, spoon, bowl, glass, pencil, rubber, scale, etc. can be used and placed in front of the child.

b. Train the child to identify familiar objects/persons in the environment and ask the child to name them.

- **Pupils can also be shown pictures of some men/women working on different jobs and asked to identify them.**
- **Discuss the activities in general, professions and positions and gradually introduce pictures of new jobs which are not familiar to pupils. Let children mime some activities of their choice.**
- **The children can be encouraged to talk about their kitchen at home, name and describe characteristic objects from the kitchen which are used daily etc.**
- **Place four objects (cup, bowl, water jug and serving spoon) one at a time on a table in front of the class. Let children take turns coming in front of the class and identify the objects without touching them.**
- **Repeat the procedure (above) using the same objects plus two others. Let pupils identify those objects at further distances, one at a time. Continue like this with rest of the objects.**

2. Matching of three and two dimensional objects

Place two sets of items, one set having pictorial depiction of objects/items on one side and the other set having models of the objects. Ask children to match the picture with its model.

3. Using critical features: incomplete drawing

a. Train the child by giving him/her a set of objects in which one object is different. For example, a set of four pens with one pen without a cap. Ask the child to pick out the one that is different.

4. Form discrimination

a. Take a cube, place it before the child in different angles and observe whether or not the child understands that the object is one and the same, irrespective of how it is placed.

b. Prepare flash-cards of the same letter in different print forms and see whether the child recognises the letter/letters written in different forms. Exercise of matching two dimensional dotted figures with real objects in the environment can be given. For examples, a child can be asked to match a dotted outline of a tree, with a complete picture of tree and then match to real trees.

5. Far Vision

a) Encourage the child with remaining sight to see any distant object like a tree or a building, or a poster in his/her surroundings and describe the features. Gradually, ask the child to look and describe objects beyond his/her visual ability. Initially the teacher can give verbal hints to facilitate description of slightly distant objects.

b) Place a coloured chart having a big picture. The child may be asked to stand in front of the chart at different distances and describe its features. Discuss with the child the distance from which his description becomes most clear.

c) Narrate stories using stick puppets. Ask children in the class to sit in rows and make the child with seeing problems sit at a suitable place. Focus attention of the child by making him/her see the stick puppet.

d) Place objects in a row at a distance from where the child can see them easily. Ask the child to name distinct features of the object using a stick.

e) Train the child to read the size of print he can read.

6. Near Vision

a) Train the child with seeing problems to read out facial expressions of the child standing near him/her.

b) Train the child to read large size print sheets at his/her level of language development by putting them on the table or at a distance according to his/her convenience.

c) Encourage the child to read large print material and gradually decrease the print size. Help the child to discover the distance from which he/she can read print at his her level of functional vision.

7. Mobility

a) Instruct the child when he goes outside to note major landmarks and visual clues reaching different places like the nearby dispensary, shops, friends house, temple, village pond, etc.

b) Train the child in spatial relations such as left/right, up/down, top/ bottom with practical exercises. Practical demonstrations can be done and the child asked to point out top/bottom, up/down, etc.

c) Train the child when walking to locate objects within his/her field of vision without turning the head.

d) Train the child to find his/her way when going up and coming down the stairs.

e) Train the child to avoid obstacles while walking.

The teacher should encourage children to make use of remaining sight in mobility in as many different situations as possible.

8. Field of Vision

l) In front of the face

a) Train children by making them focus their eyes on an object in front of theni. Remove the object and ask the child to describe it.

b) Train children to make holes and thread them on a paper placed in front of their face.

c) Train children to focus their eyes on objects and ask them what is missing? They can also be shown pictures and asked to identify the missing parts.

d) From the side of the face

e) Train the child to locate objects to his/her left without turning the head.

f) Train the child to describe what the child sitting adjacent to him/ her is doing.

g) Train the child to count objects placed within his/her assessed field of vision.

h) Place different objects having different features and encourage the child to discriminate and explain them verbally. Exercises in quantitative relationships can also be given.

9. Light / dark adaptation

a) Train the child to enter a well lighted room which he/she already knows from a dark room/corridor and find his/her place in the room.

b) Train the child to count your fingers before covering his/her eyes and immediately after uncovering the eyes.

c) Train the child to locate objects in poor light (locating an object in the drawers in a cupboard or under a table).

d) Train the child to identify and pick out bright shining objects from a dark room.

e) Train the child by encouraging him/her to play games which require covering of eyes for a short while. The child can be asked to identify the child near him/her after uncovering his/her eyes. Games such as hide and seek and other similar local games can also be played.

10. Fixation skills

a) Train the child to fix his/her eyes on a hanging branch of a tree or a bird on a tree.

b) Train the child to focus his/her eyes on a particular child in the classroom/environment and talk about him/her.

c) Encourage the child to focus his/her eyes towards a rolling ball in the playground.

d) Train the child to focus his/her eyes on a flower.

e) Encourage the child to count items in rows etc.

0 Train the child to focus eyes on the candle flame/tip.

11. Tracicing

a) Ask the child to follow with his/her eyes the movement of a moving object, for example, a moving toy, ball etc.

b) Ask the child to count stairs while going up and coming down.

c) Encourage the child to read words in a sentence by moving his/her finger.

12. *Colour vision*

a) Train the child by introducing objects in primary colours (red, blue, yellow) from the surroundings.

b) Ask the child to blow up balloons in different colours. Let him/her pair the balloons of the same colour together.

c) A teacher may take the child outside to another classroom, garden etc. and ask him/her to name objects of a particular colour.

d) A teacher may use different coloured pens, pencils, beads, blocks, pieces of cloth, etc. and train the child to group them according to colours.

e) Give the child a circle with parts in different colours. Ask the child to identify the colours. Place a smaller circle with parts in different colours on a bigger circle. Encourage the child to match the colours on the two circles by rotating them.

13. *Scanning*

a) Teacher writes a sentence on a line well spaced on paper. Train the child to move his/her finger along the line from left to right. The

teacher can use letters/stick on letters on a chart/blackboard/flannel board and ask the child to construct words and sentences. Animals, birds, transport items, etc. can also be used. Children can be asked to see letters and observe the contours.

b) On a design prepared by pasting thread on paper, the child can be asked to move his/her fingers along the thread and name the forms (triangle, joker, cat, bus etc.).

c) The teacher can also use thumb pins and make shapes with thread on the flannel board. The child can be asked to move his/her fingers and focus his/her vision along the thread. As the child masters this skill depending on his/her level of attainment, the teacher can ask the child to make shapes on their own.

d) The teacher can place objects in rows/boxes in front of him/her. Ask the child to count the objects.

e) A teacher may prepare some illustrations in dotted/bold lines and ask the child to move his/her pencil.

f) Train the child to move his/her finger on the drawn figures.

g) Train the child by making him/her solve mazes by moving his/her finger from left to right and top to bottom or vice-versa.

14. Depth perception

a) Train the child with remaining sight to jump from stairs for example, from the third and then second to experience the difference in heights.

b) Place glasses of different heights and a jug of water. Train the child to develop perceptual skill by asking him/her the following questions:-

- **Which empty glass will contain more water when filled?**
- **Which empty glass will contain less water? Fill up half the glass.**

c) Take three tin cans of different heights. Take three sticks according to height of the cans. Ask the child to put sticks in the can and tell which is the deepest?

15. Visual co-ordination

a) Train the child by encouraging him/her to play local games such as playing with, cardboard, etc.

b) Encourage the child to tear and paste paper in given figures/ designs.

c) Train the child to make and fill up shapes using dry rangoli colours, pulses, sand, brick powder, straw, etc.

d) Train the child in group activities to button, zip up, tie a knot, lace shoes, etc.

e) Train the child to play with pebbles and ball using both hands, alternately throwing and catching. It can be a game played by the child alone, or in groups.

f) If available, musical toys such as piano, tabla, drums can be given to the children.

g) Train the child to open and close the lids of objects in the environment. Similarly train the child to lock and unlock locks with keys.

h) Train the child to roll worn out cycle tyres with a stick on a given path.

16. Eye foot co-ordination

a) Train the child to walk on a rope on the ground. The rope can be placed in a straight line and in the next step in a curved line.

b) Encourage the child to walk with arms stretched at right angles on a narrow wooden plank supported on bricks on both sides.

c) Train the child to slide a small flat stone along curved and straight paths.

d) Train the child in games such as playing football, hopscotch, etc.

e) Draw patterns on the ground and train the child to jump from one square to another. As the child masters the skill, encourage the child to skip and jump on the design.

17. Visual integration

a) Encourage the child to make some forms/shapes from clay, cardboard, paper, wooden pieces, etc.

b) The teacher can ask the child to categorise objects such as asking him/her to pick out vegetables and fruits from a group of both.

c) Train the child to pick out similar coins from an assorted set of coins (for example, picking out all the 25 paise coins).

d) Train the child to pick seeds/grains/dais/buttons of the same kind from a mixed group.

18. Visual closure

a) A teacher may leave some letter/letters from words and ask the child to find out the missing letter/letters. The letter should be large enough to be read by the child with seeing problems.

b) A teacher may train the child by giving some incomplete figures/ numbers/ letters and ask the child to complete the figure.

c) Train the child to decode the message/figure in dots. Ask the child to complete the dotted path.

d) Have the child look at the parts of a picture and identify the picture that could be made from the parts.

19. Figure ground discrimination

a) Train the child by giving him/her counting exercises. Ask the child to count flowers on a plant (the roses on a rose bush etc.).

b) Train the child by asking him/her to spot objects on a background such as a fan, switch board, etc. on the walls of the room.

c) Ask the child to locate a particular spot on the object or pictures of objects such as the centre core of a cut apple.

E

d) Ask the child to distinguish foreground and background with shapes/ es.

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of 7Yaln the child to pick out all the small pebbles from a heap of big and small pebbles. The size of pebbles should be distinctly different.

20 Spatial concepts

a) Place an object, for example, a model of but and ask the child to tell positions of the door and window in relation to himself / herself.

b) A teacher may stand in front of the child and train the child by changing his/her position and asking:

- Show me my left hand (teacher should face the child).
- Show me my right hand.
- Show your right hand, etc.

c) A teacher may sit in front of the child on the table. Ask the child to tell his/her side of the table and then tell right and left sides of the table.

d) Ask the child to identify clockwise and anticlockwise movements.

e) Similarly, the teacher may put any object or object cut outs and encourage the child to see the position of objects such as in/out, over/ under etc.

21 Visual memory

a) Complete the series:- The teacher can train the child by giving him/ her exercises in completing incomplete series.

b) Part Whole:- The teacher can train the child by asking him/her to relate the parts of pictures with the whole complete / incomplete sentences/words etc.

These are some areas and activities suggested for training children who have visual problems. Using locally available material you as a teacher or parent can do can try such activities. These activities help improve their visual efficiency.

Art and Craft

The value of art is considerable for all children. It is an aesthetic as well as an intellectual activity and contributes to the full enjoyment of human experiences. Keeping in mind the need for a balanced curriculum the areas of aesthetic appreciation should not be given less importance for children with seeing problems.

Art and crafts sessions should provide times when pupils can feel relaxed and eased from tension and pressure. The teachers should take care not to make the children anxious in any way about what is expected of them. Absence of rigid competition can be an advantage of such classes.

In integrated settings sometimes children with seeing problems suffer from a limitation of choice in what they do: they can be somewhat too dependent on others, especially teachers and parents to tell them what to do and how to do it. Often this may lead to apathy in making decisions and choosing activities. The availability of a variety of media and processes can encourage children to experiment freely with materials and ideas and to decide after experimentation to try to follow through an idea and to express it. Balancing such freedom of choice may bring the discovery that certain laws of nature exist which have to be taken into account. Intellectual aspects of art such as form, balance, contrast and design are meaningful ways in which concepts can be understood.

A good opportunity can be provided in art and craft lessons for encouraging social skills and language development. In integrated settings shared activities such as collages (which incorporate colour and texture) can be invaluable in promoting co-operation and friendly interactions. When children are intensely engrossed in an activity which they enjoy and are relaxed they are able to explore and discuss deep seated feelings about themselves. A perceptive and sensitive teacher can carefully listen and provide the required encouragement.

Some children with seeing problems can have poor fine motor co-ordination and this can be developed and improved through the manipulation of tools and craft materials. Careful teaching both in terms of safety and competence are required. One to one demonstration may be needed in the use of scissors, holding crayons/paint brushes etc. Crafts that might initially not seem suitable for pupils with seeing problems, with practice gradually become manageable and enjoyable. Local crafts such as wood carving, wire mesh, clay sculpture or leather craft etc. can be encouraged.

Some children with myopia excel in fine line drawings and produce graphic work of high standard. These children can be highly motivated to use their vision and to work for increasing lengths of time. Strongly coloured crayons, poster paints and felt tipped pen can be used for drawing.

Mathematics

All over the world mathematics is included in school curriculum for its vital utility in developing scientific attitude in pupils. The National Policy on Education (1986) has visualised mathematics as a vehicle to train the child to think logically and reason and analyse systematically, keeping in view the increasing importance of studying mathematics in today's technological world and Its practical utility in handling day to day problems in life.

Considerable learning takes place from daily situations which may be incompletely evident to children with particular kinds of seeing problems. Concept such as conservation develop as children see examples of it occurring in day to day situations. For example a child with normal vision will observe his mother pouring sharbat (cold drink) from a large jug into glasses on a hot summer day. He/she may observe her laying th.alis (plates) on a chatai (mat) and then stacking them into a pile to form a tall shape.

Opportunities for discovering and use of manual skills need to be given in school. The school day must expose the child to a numerate environment with opportunities for incidental learning to classification, terms of weight, volume etc. Practical activities involving shape discrimination can be explored. All these activities can and should be planned with the other children.

Care should be taken to keep in mind the requirements and not expose the child to highly visual designs with full page diagrams/graph. A lack of a clear definition and contrast can make such material difficult to discriminate. Modifications can be undertaken to suit the child's needs.

In the early years work in mathematics will need to have a practice basis to ensure the understanding of increasingly, complex concepts and relationships. Appropriate and relevant language will need to be used while referring to shapes, size quantity etc. Individual demonstration of processes may also be required.

Children with seeing problems may require additional time for recording their work because of the visual task involved. Children with visual field defects may for example find long division which involves visual scanning and searching time consuming. The teachers need to remember thus that these children may not be able to produce work quickly although they may be able to cope with the thinking involved like their peers.

Opportunities can be provided to explore and discuss topics in groups and pupils contribute individually in a form that is appropriate for them. This ensures that work is based on experience and understanding and not simply on the reproduction of information. Learning takes place for all children in such settings.

The aim of the activities must be clear and remain the focus. An intensive pupil-teacher interaction is essential Teachers need to assess when to intervene, direct and reinforce.

Mathematics has a language which needs to be used with a real understanding. Children should be encouraged to ask questions in order to gain information to verbalise what they discover and conclude. The teachers must listen to the language these children use. It is possible to learn much about the gaps that exist in the concept formation. For example in an activity session a teacher can pile up different types of stones for children to handle and play. Guiding questions such as the following can be posed:-

- **Are the stones rough or smooth?**
- **Are they all of the same size?**
- **Which is the heaviest?**

A constant evaluation in questions and discussions form is required of the language relating to mathematics concepts. Some processes in mathematics may pose particular problems. For example estimations of quantities/lengths etc. may become difficult because of problems with sight. Concepts of time and distance are also not easy to understand. Practical activities can be especially valuable for children who have sight problems. The equipment that children use needs to be checked for legibility. For example, rulers and protractors may bear small figures that are hard to discriminate. Mastering basic concepts at elementary level is essential for learning this subject at higher level. Appropriate and adequate teaching learning material should be provided. During the early years mathematics should be related to real experience, to concrete material and to practical activities.

CHAPTER 3

CLASSROOM MANAGEMENT

As a teacher you may have apprehensions about the safety angle as children with seeing problems move about and work in the classroom. You may wonder whether alterations to the environment are required for safety and access to buildings and classrooms as for pupils with physical handicaps? Children with physical handicaps in wheelchairs do require some environmental adaptations. We do try to meet their needs for ramps, adaptations to toilet facilities etc. What adaptations are necessary or desirable for pupils with problems in seeing? How can we manage children with seeing problems in our classrooms? This chapter helps to focus on possible answers to these crucial questions.

When a child with seeing problems is gaining confidence in independent movement a reasonable predictable and orderly environment is helpful. Body awareness and orientation in relation to fixed objects and furniture are also equally essential. These are best established in the pre school years and fostered in the early years at school.

Experiences of exploring the environment at home should be provided before the child begins school. The former will not only be stimulating as an activity in Its own right but a helpful and positive preparation for coping with the wider and more varied situation of school.

As a teacher you must expect from children with seeing problems a range of levels of skills in independent mobility and in competence in using the environment fully and safely. The ability to meet the demands of the school environment will depend upon the training for use of any vision possessed, encouragement for physical independence spatial awareness and a sense of direction etc. Planing and implementing training programmes geared towards helping children with seeing problems that make use of the residual vision are more beneficial than adapting the environment significantly.

The layout and organisation of the classroom should enable the child with seeing problems to develop his/her facilities to understand and use the equipment and material easily by responding freely and accurately. Reorganisation of both storage and seating arrangements in the class or resource room may be constrained because of limited resources, size of the room and size of the class in it but even so it may be possible to

improve the present situation by looking at it purely in terms of its current use. The ultimate aim should be to help children with sight problems to use as much standard material as possible in common with their classmates.

A good classroom planning and organisation and an awareness of the way in which children relate to and use their surroundings can help to reduce at least some stresses and confusion that can arise in day to day work. Obviously an overcrowded room with either poor lighting or too much glare from unshaded windows and haphazard storage of materials adds to the daily problems of self organisation and building an awareness of the ways in which all children including those with sight problems relate to and use their surroundings.

Increased attention to environmental factors are advantageous to all the pupils in the school. A good lighting, elimination of glare, use of colour and tone contrast, comfortable seating and sitting arrangements clear large graphics at eye level, orientation and simplicity of layout have all been seen to provide positive benefits. Relatively small changes in the layout of a room or in its lighting and furniture may seem insignificant when considered separately, but the sum total of such adaptations can result in so much, more pleasing and efficient surrounding for children with seeing problems.

The teacher must not look for carefully worked out guidelines of suggested seating arrangements its relation to classroom lighting, blackboard and position of other fixed furniture etc. This is so since we expect the modern classroom with active learning and mobile enquiring pupils as against a static teaching situation.

Encouragement to use sight effectively in daily classroom situations can be reinforced by a working environment that facilitates exploration. Many children with seeing problems may need to spend time visually investigating objects in the classroom or in the natural environment to broaden their visual experiences, stimulate interest and learn to see more advantageously. They need to be given opportunities to handle three dimensional objects before they start to interpret two dimensional representations. Interactive play situations with peer can provide scope for this required exposure.

Seating Arrangement

The nature of the activities structured/informal group work will, to a large extent, determine the seating arrangements. It is not essential that one

seat is reserved for the child with limited sight permanently. The seat can be changed according to the requirement of a particular activity. For example, it can vary with the work involving near or distant sight. Small alterations can make a difference to the visual comfort of a child with seeing problems. The teacher can try different places in the classroom from where child with limited vision can see the blackboard. Usually the seat on the first bench is preferred by children with limited sight.

A major factor that should be considered is the appropriate position that enables them to use their sight effectively. The seat should be in a place from which pupils can most clearly and easily see the blackboard or any demonstration. A child with a limited visual field May have to sit at an angle rather than square to the blackboard in order to use the remaining vision usefully and to discriminate what is written on it. There should be more light on the blackboard. LARGE SIZE writing on the blackboard will facilitate reading by such children.

Lighting

The children with limited sight require adequate light to identify objects and see their features/characteristics without distortion. Sometimes light/ glare cause distortions. Most classrooms in the building, particularly in rural areas, may not have adequate number of windows. Despite the fact that there is adequate light outside the room it is possible that there is inadequate light within the classroom. But there is usually a door. If it does not let in light, even then it may be kept open and the child with limited sight can be shifted near the door so that natural light is available to him/her. If there is a window the child can be seated near the window. If the window does not have transparent glass it will have to be kept open. During extremely hot /cold days, the windows and door/doors can be kept partially open, if no other arrangements are available for lighting in the room. Wherever there are double shifts and classes are held in the afternoon artificial lighting arrangement may need to be made. Tube light should be preferred to bulb light. A tube light spreads the light uniformly and consumes less power.

The desks, tables, walls, floor, ceiling, etc. should have a non reflective surface to reduce glare and eye fatigue. Wherever possible, special light can be provided at the desk of the child with limited sight, with an in-. built light to avoid glare and direct light on the eyes. Strong overhead light may reflect on the magnifiers etc.

Some children with seeing problems as stated earlier have difficulties in tolerating bright light. An ideal working position for them should not be where there is glare or bright light corning on to the face from a window. Instead arranging the seating with light from the window coming from behind the pupil on to the work surface is helpful. The teacher should take care not to stand in front of the window while talking.

In rural areas, the classes are also held outside in the shade of a tree during summer and under the sun during winter. Seats should be arranged in such a way that glare and direct sun can be avoided for children with seeing problems.

Classroom Environment

In classes we find displays such as charts/diagrams, samples of children's work, instructional/informational materials (graphs) etc. Sometimes teachers hang their displays on strings hung across the classroom. All the material which is a part of the informational and aesthetic environment should be displayed in such a way that enables them to be appreciated by all children including those with sight problems. They should be placed to the eye level so that it can be read without difficulty by all the children. A background paper (white in colour) should be used and the display material mounted on it. A few displays for example collages with designs/figures etc. made by children should be changed quite frequently to stimulate and maintain interest. Avoid overcrowding the area with closely packed displays.

The teacher should also provide objects for children to handle and carefully explore. This helps to form concepts relating to solid objects. Simple shapes with bright colours when used on a surface that is not too shiny are particularly suitable and provide the visual stimulation. Good lighting should be directed on the objects being used. The teachers should take care to present the material clearly and legibly. This will help all children. The motivation to use sight purposefully, the interest in the task, proper lighting and position of work help to use the teaching materials with little adaptation.

Labelling in large print materials and equipments kept in the classrooms and using colour codes according to contents for storage spaces have been found to be very useful. Children's involvement in deciding colours can increase interest and emphasise the need for good personal organisation.

Children may also find the learning materials that they are required to read visually complex, finely or densely printed difficult to decipher. The

teacher should keep handy special materials and visual aids for use in different activities. They need to be observant during reading writing sessions and when children are involved in other activities and note difficulties in using them.

The child with limited sight gets fatigued sooner than other children. The teacher may look for signs of fatigue. Rest should be allowed to the children by giving a gap between the planned activities. Changing activities for sometime and then taking them up again also helps.

Efforts should be geared towards looking for practical approaches to reduce environmental noise. This will be helpful to all pupils to pick-up sounds (teachers instructions) without undue difficulty and strain.

Contrast

Proper colour contrast is helpful in providing meaningful visual experiences. Care to look into the following aspects of the classrooms environment both inside and outside help children with seeing problems.

- Simple change in environment should be made to help the child with limited sight and natural contrast must be utilised for these children. For example, for going up the stairs can be easily recognised by the child with limited sight by observing the shadow produced by the stairs On the other hand going down the stairs is not so easy for children with seeing problems. A contrasting line should be painted on the edge of each of the steps. It will provide extra help to children with limited sight.
- The ceiling can be white to reflect light and the paint should be such that it reduces glare.
- The door should have different colour than the door frame. Similarly windows should have a different colour than the colour of window frames.
- The wall should have different colour than that of the door and window. A combination of cream colour and black can be helpful.
- Charts, maps or colourful drawings in basic colours should be pasted on the walls which are related to the textbook material. But too much loading of information should be avoided.
- Desks and benches may have colour contrast so that they can be properly identified by the child with limited sight. In absence of such a facility, the corners near the pathways can be brightly coloured by paint or paper.

CHAPTER - 4

VISUAL AIDS AND THE USE OF TECHNOLGOY

Potential solutions to many of the problems faced by children with seeing problems are being offered by technical developments. Low vision seeing aids, as the term implies are designed to facilitate the use of remaining sight and range from simple magnifiers to the complex Closed Circuit Television. (CCTV). Access to curriculum has become easier with facilities such as CCTV. The latter makes possible small or detailed visu - 1 material to be thrown up as enlarged image on the television monitor.

As the range of sophistication of available technology increases, so does the problem of selecting the most appropriate equipment for specific tasks and learning situations. Some equipment is very expensive, and its purchase needs to be considered in relation to the total resources available. Arrangements for storage of the equipment and access to its use also need to be planned. The effective use of any piece of equipment will involve some training and will require taking time out of other areas of curriculum. The varied demands will need to be carefully assessed.

Before using visual aids children need to be correctly identified and functionally assessed. This assessment should be done in the classroom, home and in leisure situations. A visual aid should be selected in consultation with an eye specialist (wherever feasible).

Wearing glasses with thick lenses using low vision aids is likely to evoke sometimes teasing or bulling. This, however, is seen to happen more in the later years than in the early classes. It is helpful to discuss and explain in simple terms when they are used. All children can also be allowed to make any remarks, handle aids and ask any questions. All teachers soon get to know their class and judge the best approach to use in helping individual children to join in shared activities. Each teacher should devise her own technique to promote situations in which children with special needs including those with seeing problems are seen in positive situations. Different settings in the classroom can be organised where children with seeing problems can offer help to others as well as receive.

Suitable training in the use of visual aids should be provided to teachers working with these children. They need to be in a position to guide and train a pupil using visual aids in various ways such as fixation, eccentric

viewing, holding reading material at an appropriate distance, spotting and scanning etc. Teachers also require an orientation to the different kinds of visual aids their parts, appropriate handling methods and care etc. They need to know which aid is appropriate for a particular child in the class.

There are two types of aids which can be used for children with seeing problems.

- Optical aids
- Non-optical aids

Optical Aids

The most frequently used optical aids are the microscope and the telescope. The power of magnification of microscopes vary from 1 X to 10 X. Microscopes can be used for close work, whereas telescopes help to view the objects from arms length distance to Infinity. Usually the microscope gives a wider viewing field but short working distance. The telescope on the other hand provides a larger working distance but smaller field of view. The simplest form of microscope is the convex lens, the magnifying effect of which is caused by the curvature of the lens.

Both microscopic and telescopic aids can be hand-held, mounted, or fitted into a pair of spectacles. The use of microscopes by the child with seeing problems may help in discriminating printed letters, but reading may be slow and laborious for long assignments.

In activities that require mobility, the telescope is useful. It can be useful for these children in identifying street names and bus numbers, or getting any other visual orientation of the environment while travelling. A variety of magnifiers have been used for decades. Illumination is as important as magnification. Often a child's vision can be substantially improved by providing appropriate lighting. Three types of man made illumination are available viz: the incandescent, halogen and fluorescent.

Hand-held *Magnifiers*

Hand held devices are best for quick vision tasks. Their portability and low price are also advantages. A circular glass lens fixed with the frame and handle, it may be round, rectangular, disc like or a bar type. When it is focused properly and it is held over the page of a book, the size of the letters increases.

Their major limitation is that tasks that require the use of hands are not possible, and extended reading is uncomfortable. Children with limited dexterity do not find these magnifiers useful.

Folding Magnifiers

The shape of the glass lens may be square, rectangular or twin circular. The frames of the glass may be of plastic. leather or aluminium. They are easy to handle as their handles can be folded.

Stand Magnifiers

These are adjustable stands and can be held at a suitable distance according to the capacity of the child to read printed book. Some hand movement may be required, depending on the size of the lens and the print. An optimum stand will have a clear base and no legs, thus allowing more light to reach the reading material. High magnification stand magnifiers have a limitation of causing discomfort. As magnification power reaches 4 x (16 diopters) or above, the size of the lens becomes smaller, so the child must place the magnifier on the reading material and the eyes must be directly on the magnifier lens. Some positions result In poor posture and many shade the natural illumination in the room. Thus for the same reason It is also difficult to write under high power stand magnifiers.

Head borne Devices

There are different designs, shapes and magnifications available. These devises leave the hands free and are therefore especially useful for reading, serving and any other tasks that require the use of hands.

Pocket Magnifiers

As the name implies it is easily used by children with seeing problems as they can be kept inside the pocket.

Illuminated Magnifiers

Utilising a bulb, these magnifiers can be powered by either ordinary batteries or re-chargeable batteries. Using these magnifiers a particular area can be brightened and enlarged.

Spectacles

The child with seeing problems may use spectacles made of magnified lens/ lenses provided by the ophthalmologist.

Bar Magnifier

Using a bar magnifier for example with a 1.5 x lens, size200x25mm a child with seeing problems can read one or more lines at a time.

Closed Circuit Television

The CCTVs are of great help to children with remaining sight. They can read books or printed material, with desired magnification at their eye level .Printed material is placed on a stand which can be moved sideways and hack and forth so that a different section can be presented to the camera resulting in a magnified image displayed on the screen. The magnification can be far greater than that which can be provided by other low vision aids. Print material can be magnified from five times to forty times. In addition most closed circuit television systems allow a negative image to be presented on the screen, that is white on black instead of black on white. This has the advantage of reducing glare for children with seeing problems. Many children find the negative image easier to see and less tiring for longer periods of viewing.

Some CCTVs incorporate a camera which can be focused on more distant areas, such as the black-hoard or demonstration table. In integrated classrooms there can be particularly useful in making the information on the blackboard available to the pupil. Children can work in a more relaxed position while viewing the CCTV screen from a normal distance than when doing desk work. This reduces the possibility of fatigue and tension. A group of children can use it simultaneously. This prevents the social isolation which can be caused by the working situation of children with seeing problems.

The systems are however expensive to purchase. They also require funds for maintenance and repair. Regular checks need to be made to ensure that the equipment is being used efficiently by the pupils. Training is required by both the teacher and the pupils to use them effectively. Most systems are heavy and bulky. This aid may not be available all the time in integrated classrooms at the secondary school stage when lessons are taken in a number of different classrooms.

NON-OPTICAL AIDS

There are some non-optical aids which may be adopted according to the needs of children with seeing problems. These aids help such children in performing tasks involving near sight with ease. The non-optical aids ean—be used with the following:

- Light (artificial or natural)
- Lamps with fluorescent light
- Filters
- Pinhole frames
- Slide-shields
- Typoscopes
- Dimmer
- Tints
- Large print books
- Writing and signature guides

Reading Windows

Signature guides can be used as reading windows while reading a book. A person working with these children can also use black cardboard and cut out strips to make improvised reading windows.

Cassette Recorders

They have various uses In the classroom. Talking books are produced today on cassettes slide projectors and microfilms and also help the readers.

Felt Pens

Felt pens with various colours for writing and painting can be effectively used by children with sight problems.

Mobility Aids

These aids help the child with seeing, moving and exploring the environment. A cane is an example of a mobility aid.

Adjustable Reading Stand:

These stands can be adjusted at a comfortable degree for reading and writing. Such stands can also be made out of locally available material. Wooden strips, bamboo, plywood and jute cloth can be used for this purpose.

Your aim as a teacher is to improve the learning potential of all children including those with seeing problems in your class. The above brief account of the aids and the guidelines for classroom management in the earlier section will help you in achieving this aim. Do you have something more to suggest? Implement your ideas and supplement these. Systematic and sustained efforts are required.

APPENDIX

To provide opportunities to develop skills in:

- Left to right eye movement for reading.
- Keeping ones place in a row or in a section and holding and marking with pencil.

Instructions for Teachers

Select familiar pictures of animals/llowers/objects/shapes and arrange them in **rows.** Children can be asked to count them, join them with a line etc.

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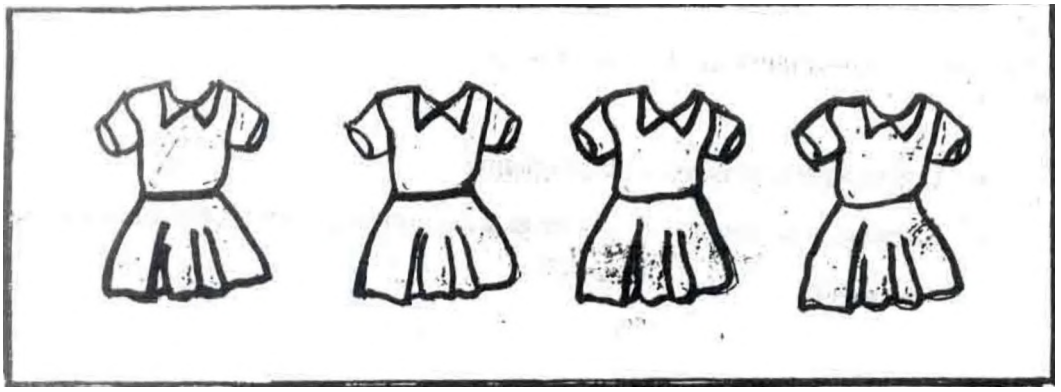
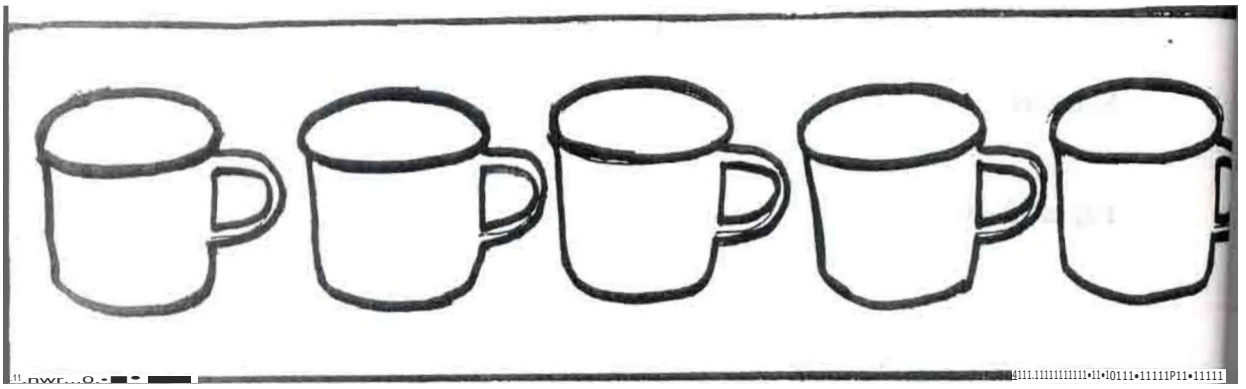
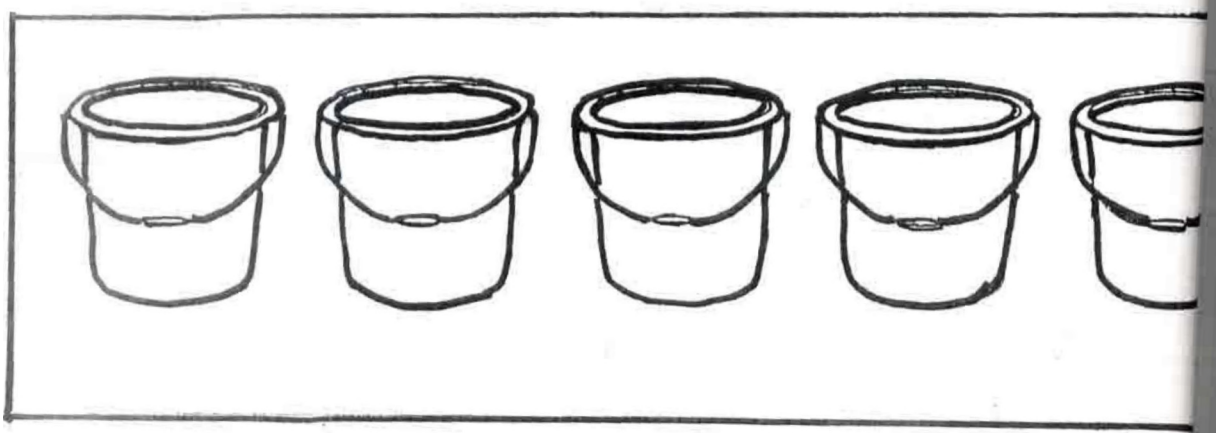
Connect two pictures with a line and colour them







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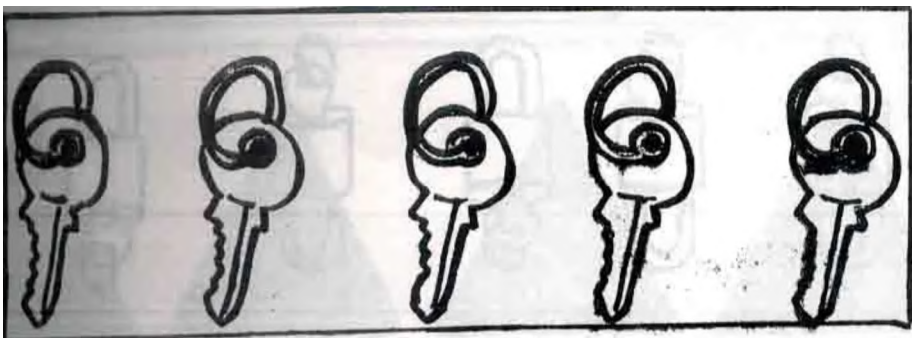
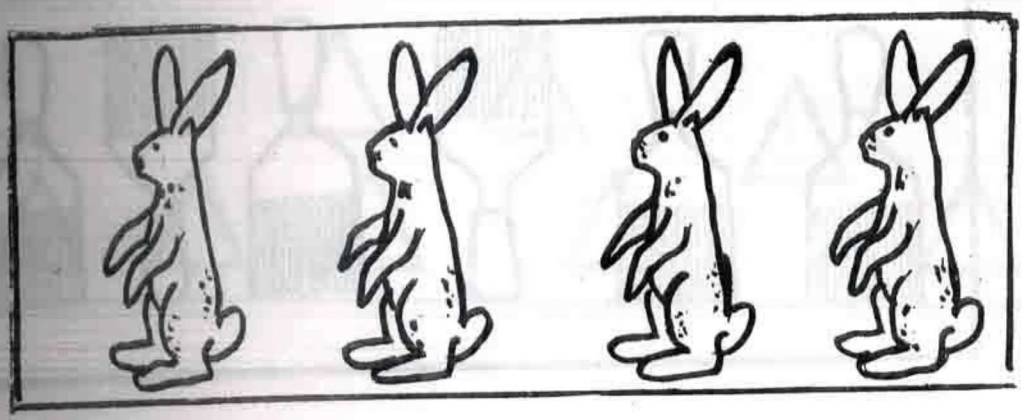
In the empty space draw as many circles as there are pictures





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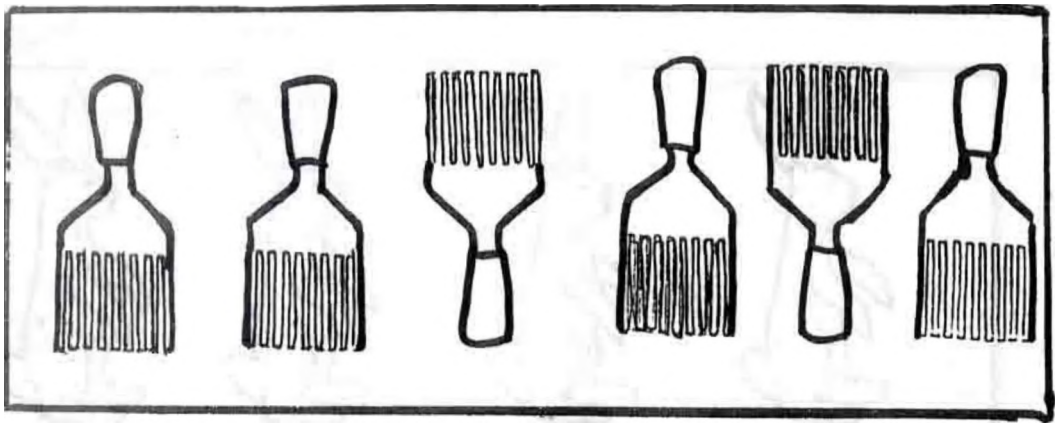

In the empty square write the number of figures in each row

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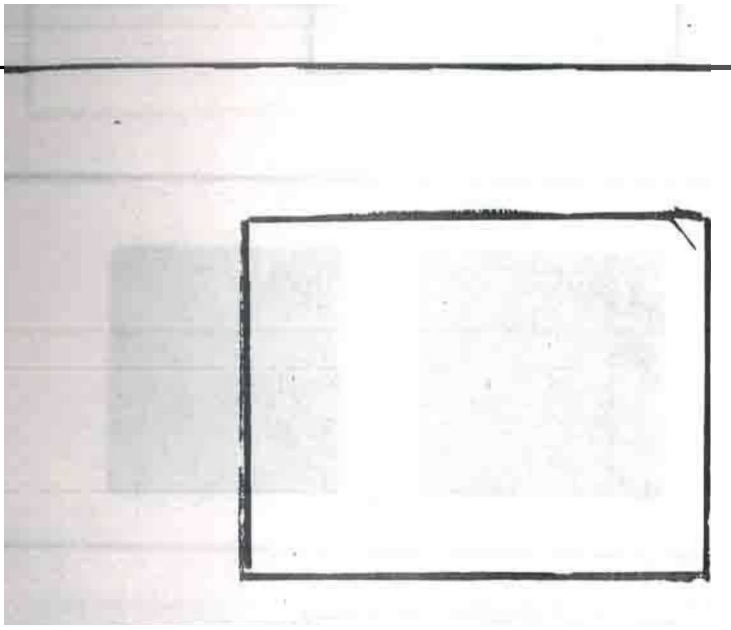

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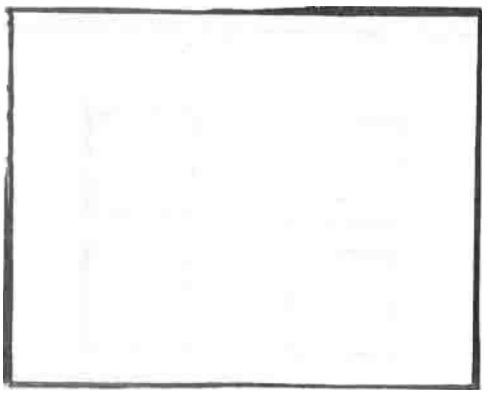

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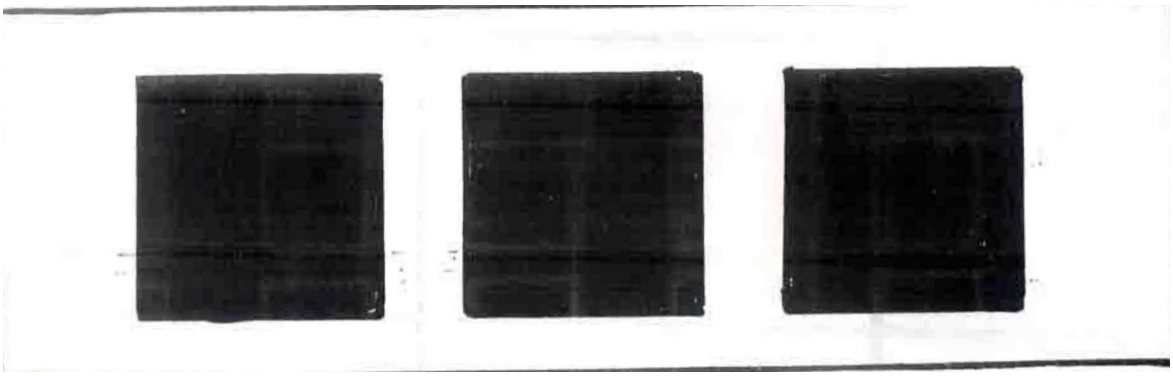
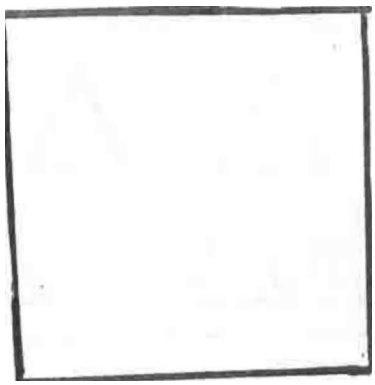
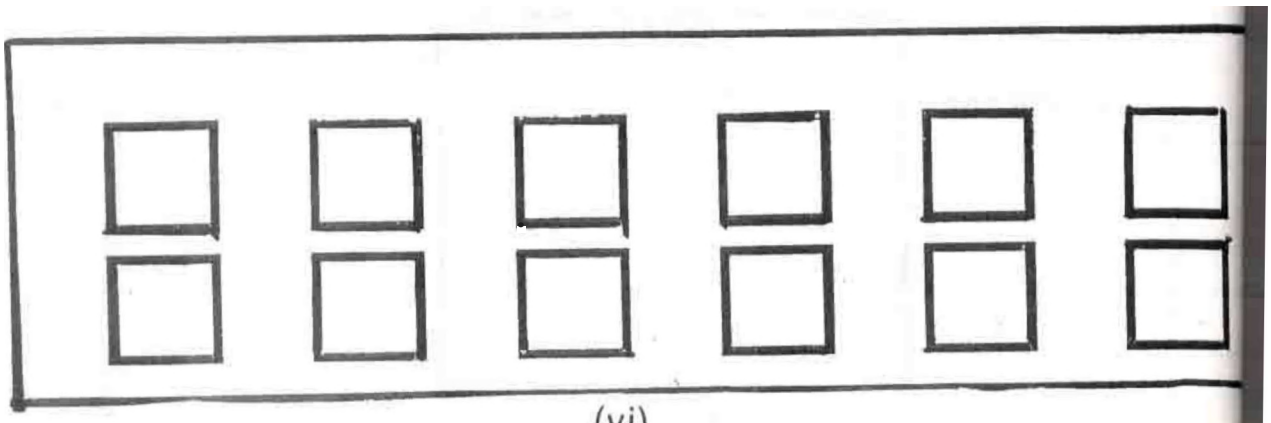
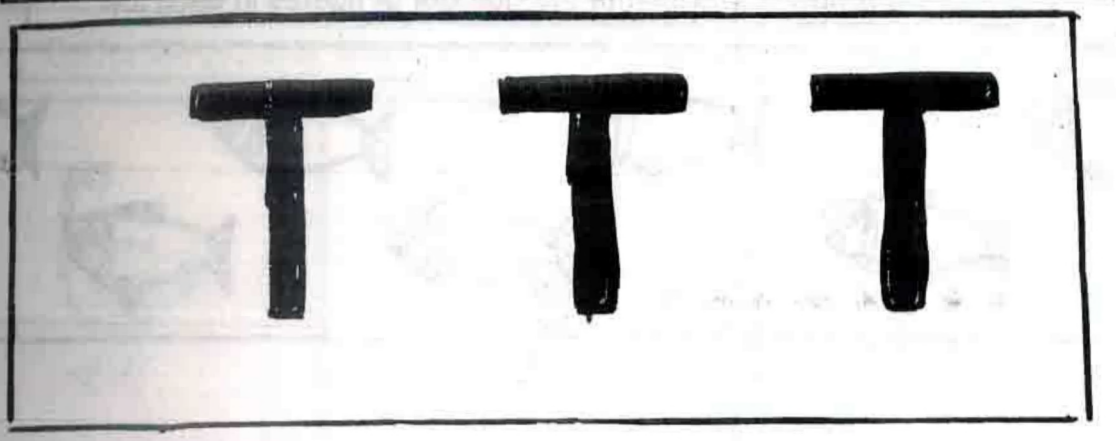
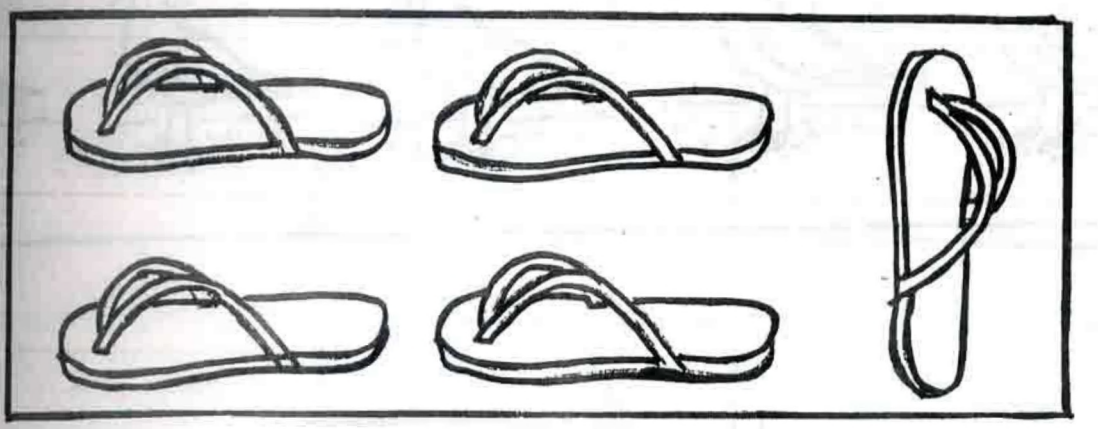


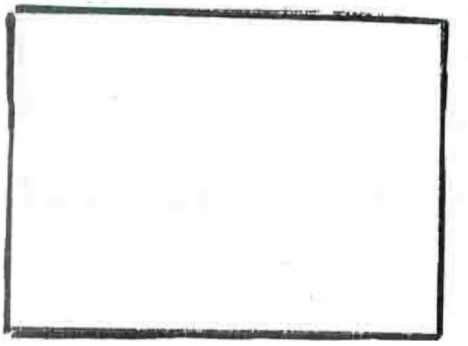




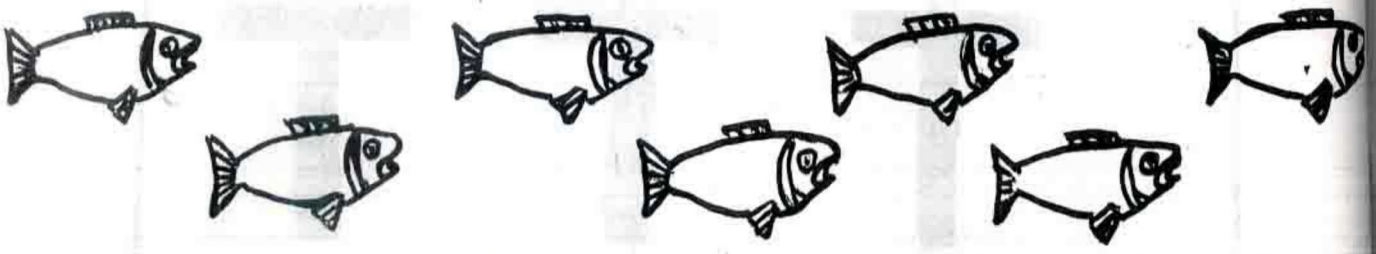
In the empty space write the number of figures

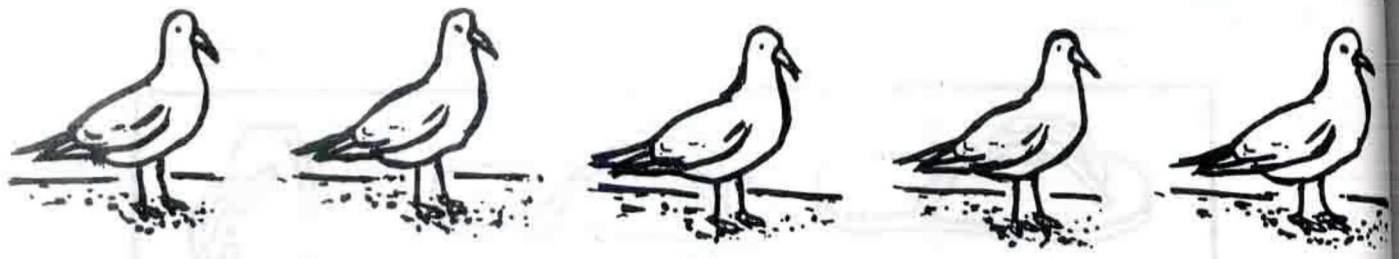




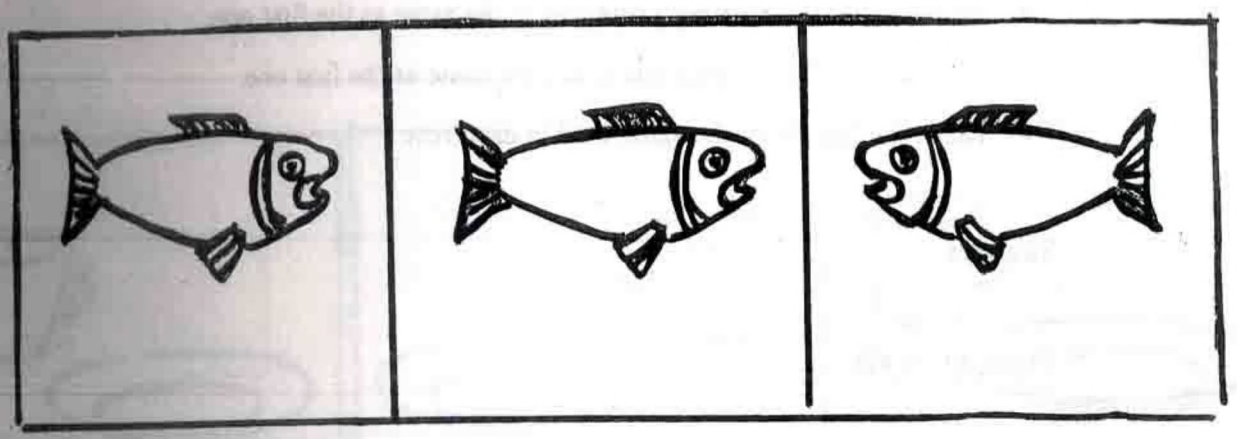


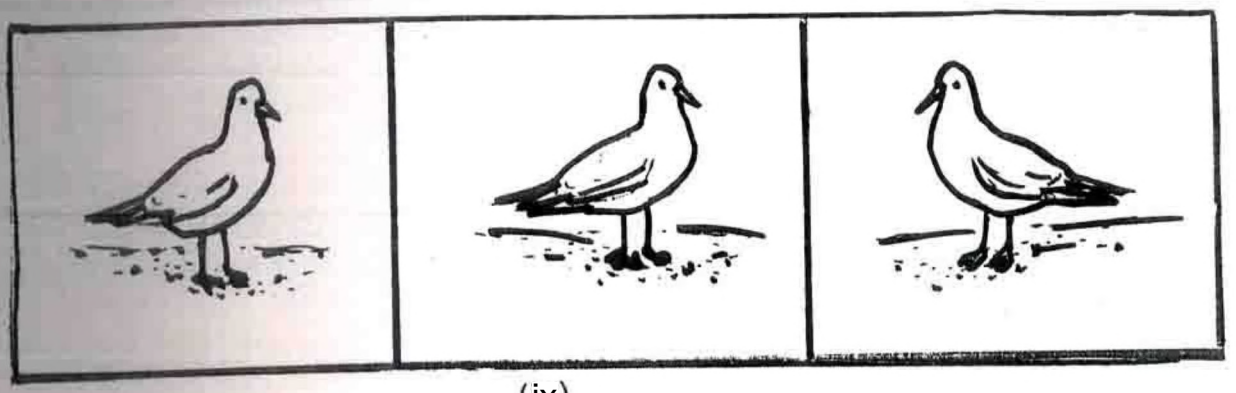
In the empty square write the number of figures in each row





Colour the pictures which are the same as the first one in each row 1





Aim H

lo provide opportunities to observe similarities and differences in SHAPES among objects of the same size and colour (black and white).

Instructions for teachers

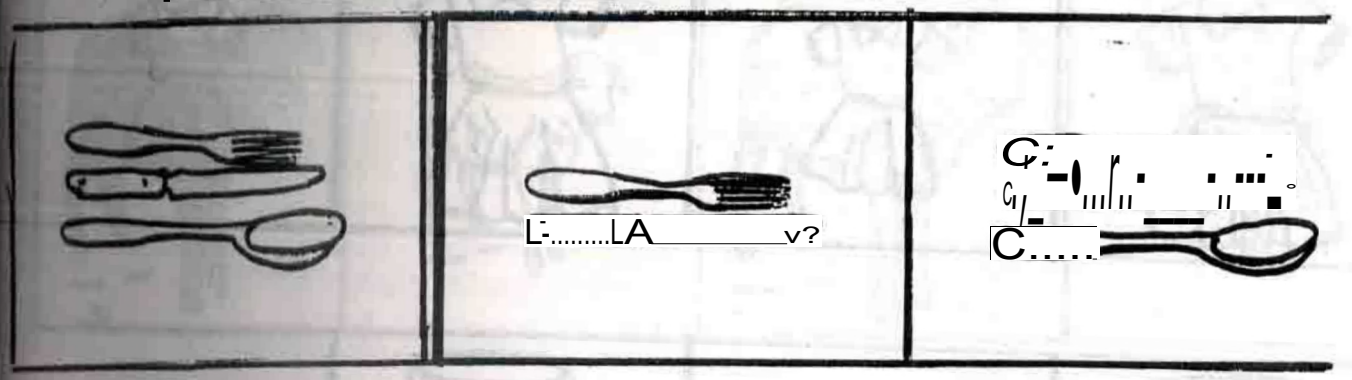
Select familiar pictures of objects/animals/flowers/shapes and arrange them in rows. Children can be asked to use them in varied ways.

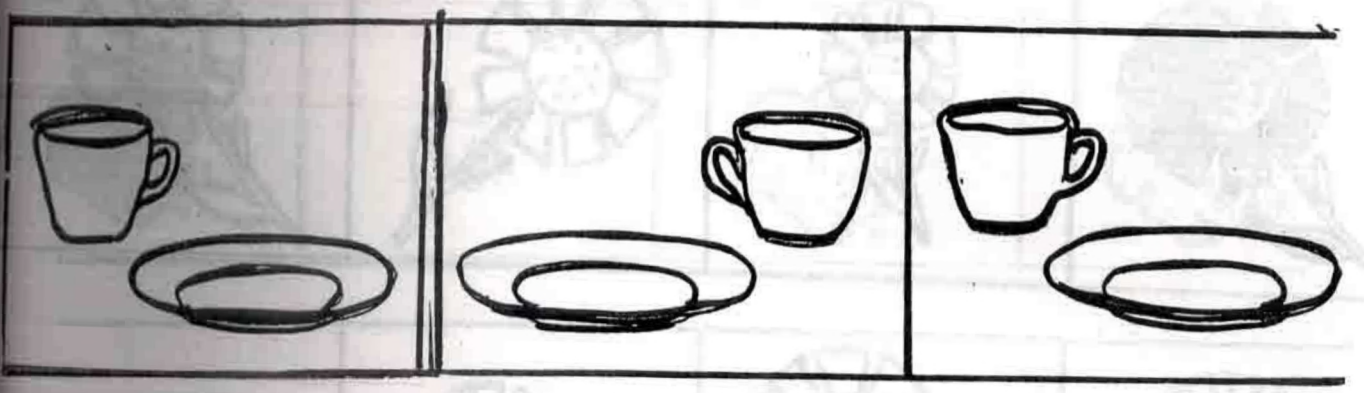
- Make a cross on the same pictures and a ring on the different pictures in each section.
- Draw a line under each picture that is the same as the first one.
- Colour only the pictures which are the same as the first one.
- Mark the figures of the same kind in each row.

Samples

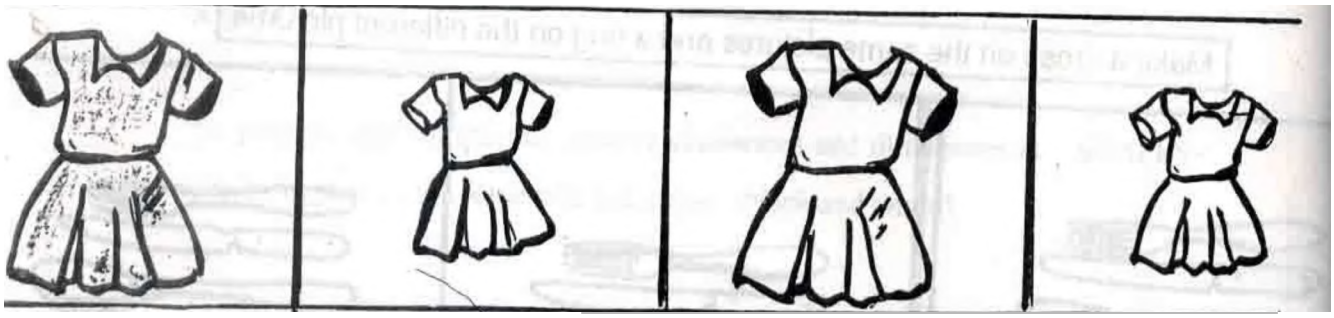
Pages xi to xiii

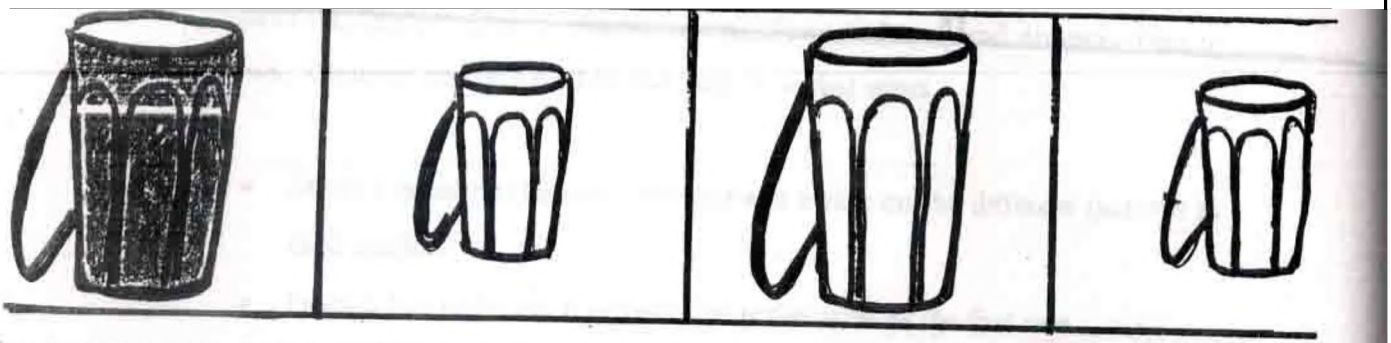
Make a cross on the same pictures and a ring on the different pictures

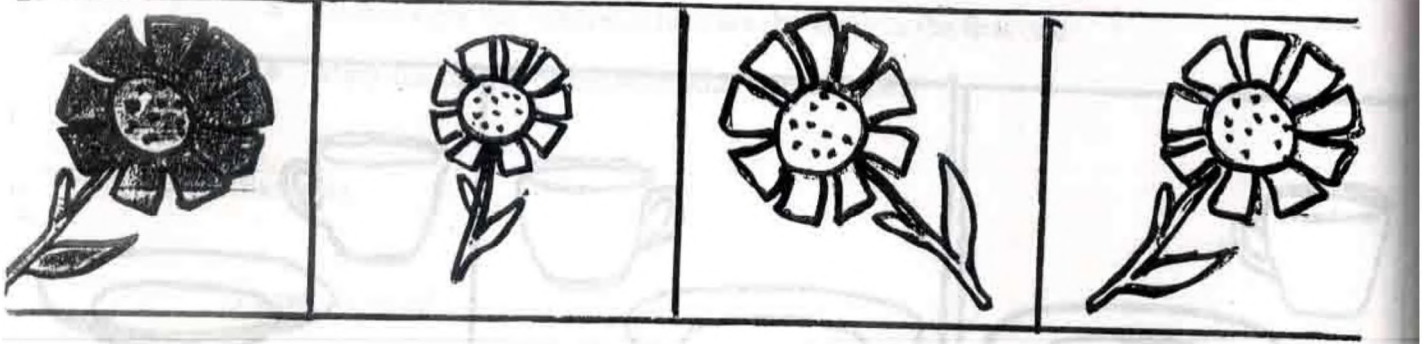


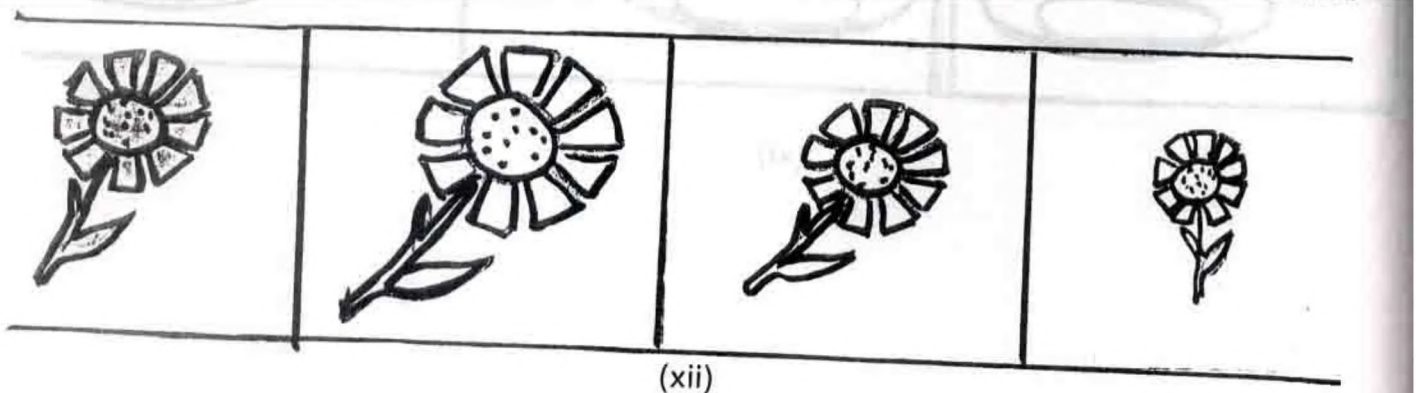


Colour those figures which are the same size as the first one in each rowl

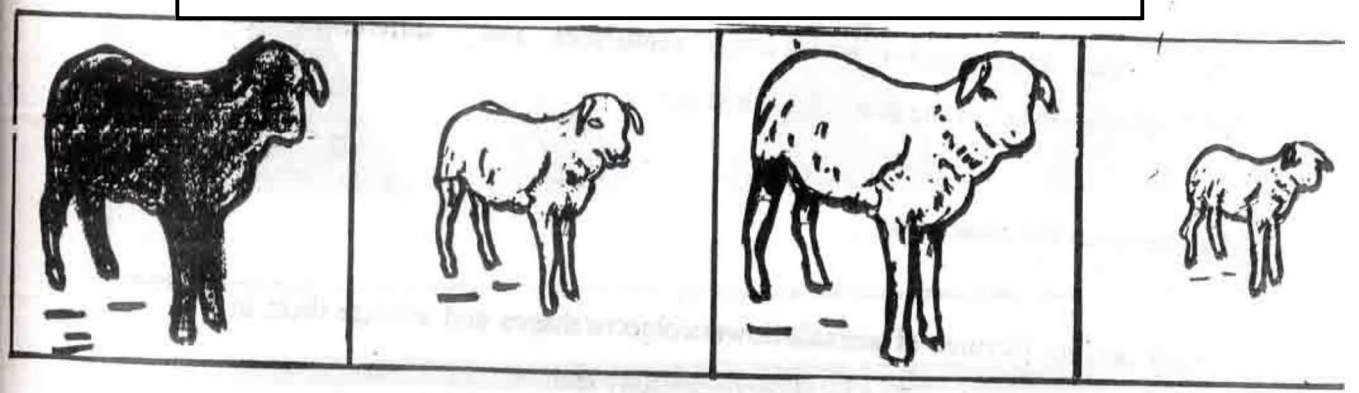


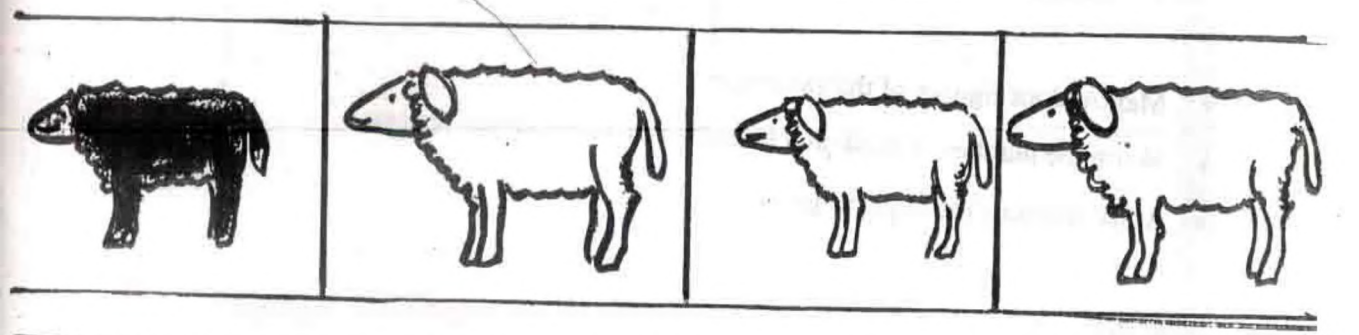


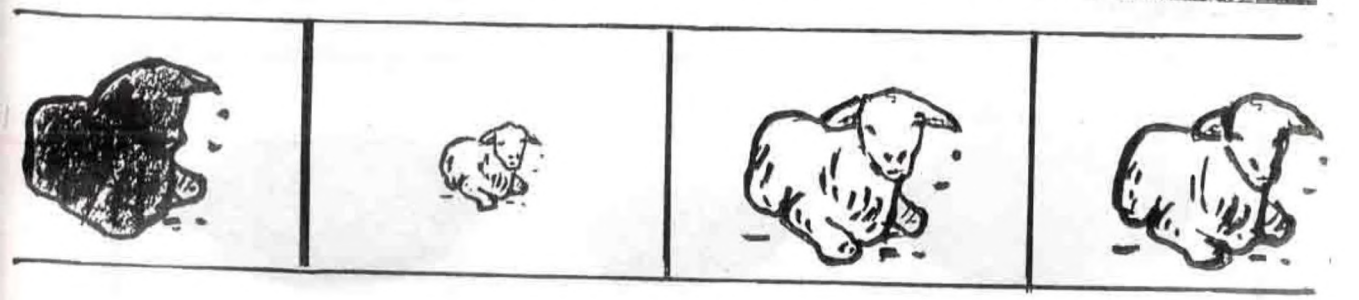


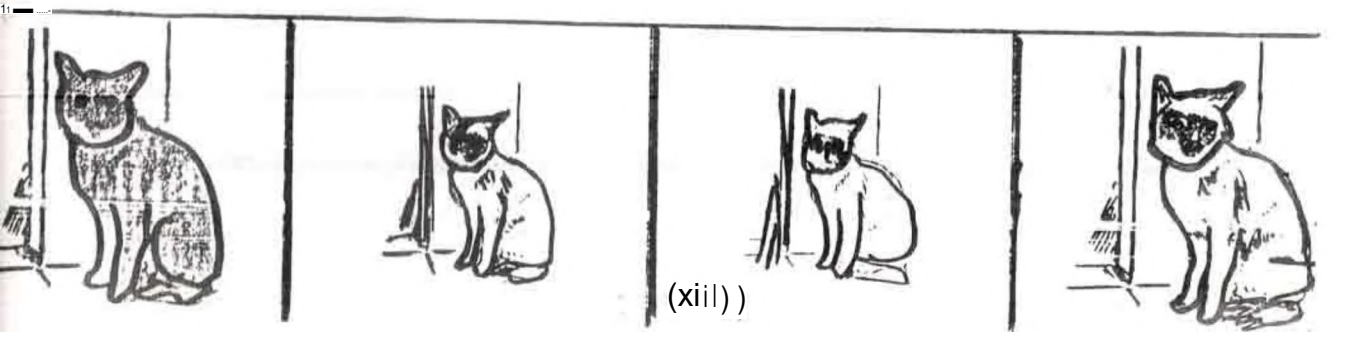


Colour those figures which are the same size as the first one. Then count them. I









Aim III

To provide opportunities to observe similarities and differences of SIZE among object of the same shape and colour.

Instructions for Teachers

Select familiar pictures of animals/flowers/objects/shapes and arrange them in rows. Children can be asked to observe carefully and:

- Mark/colour figures of the same size.
- Write the number of small and large figures in the empty spaces.
- Mark the smallest/largest figures.

Samples

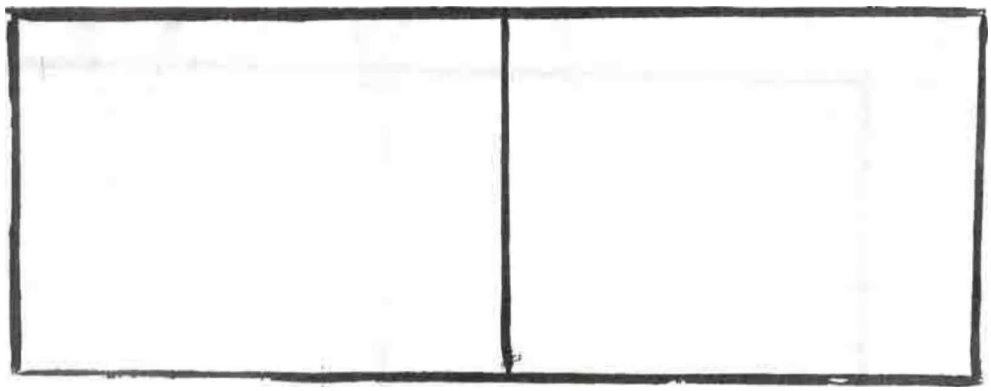
Pages xv to xix

In the empty space write the number of small and large figures

0

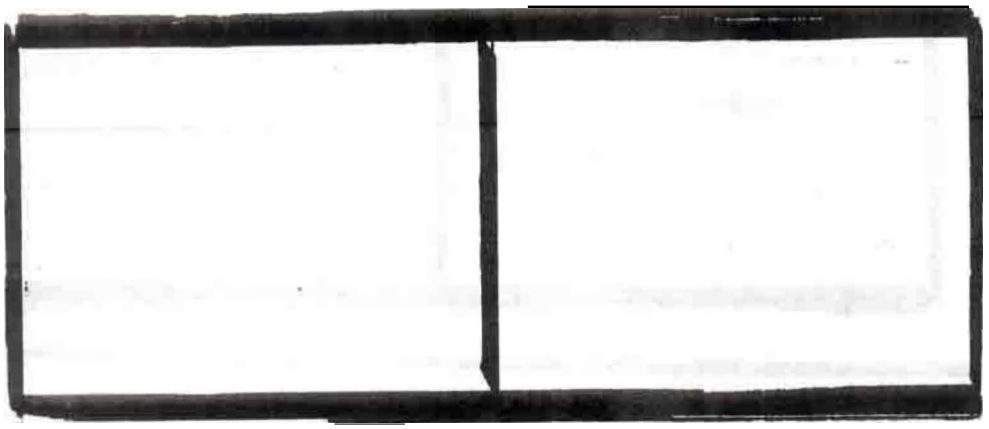
AAAA

1,



In the empty space write the number of small and large figures

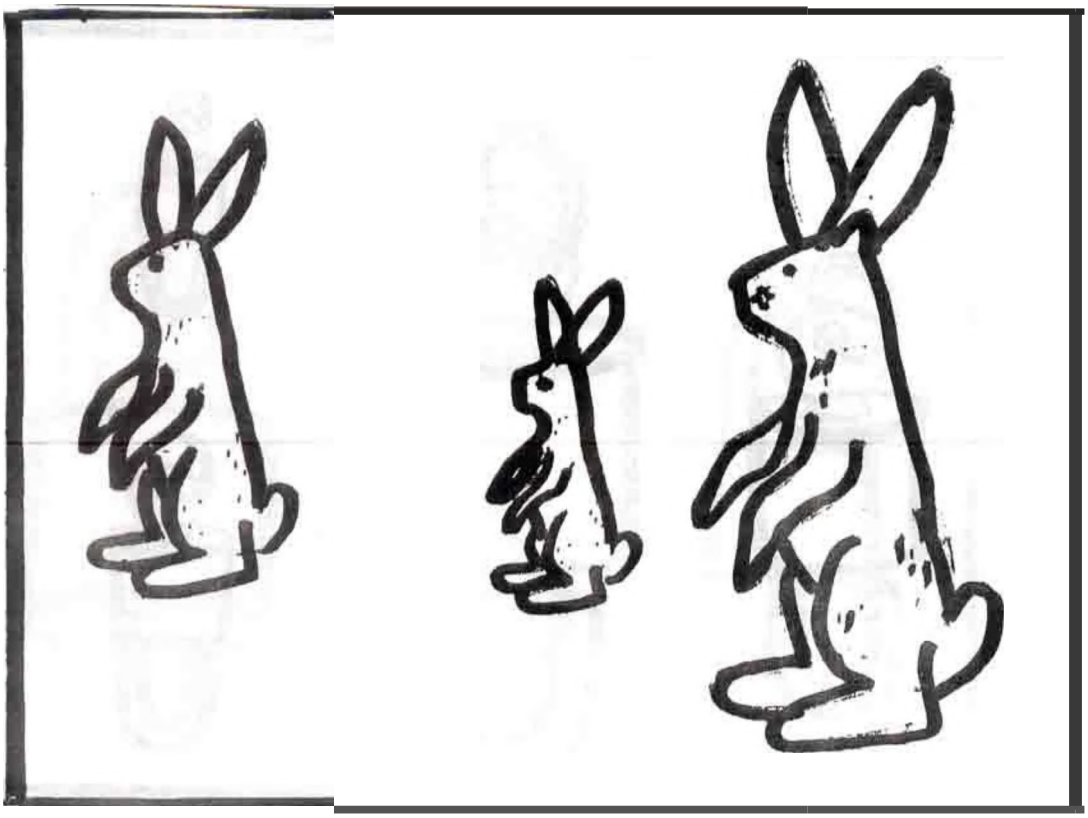
T T

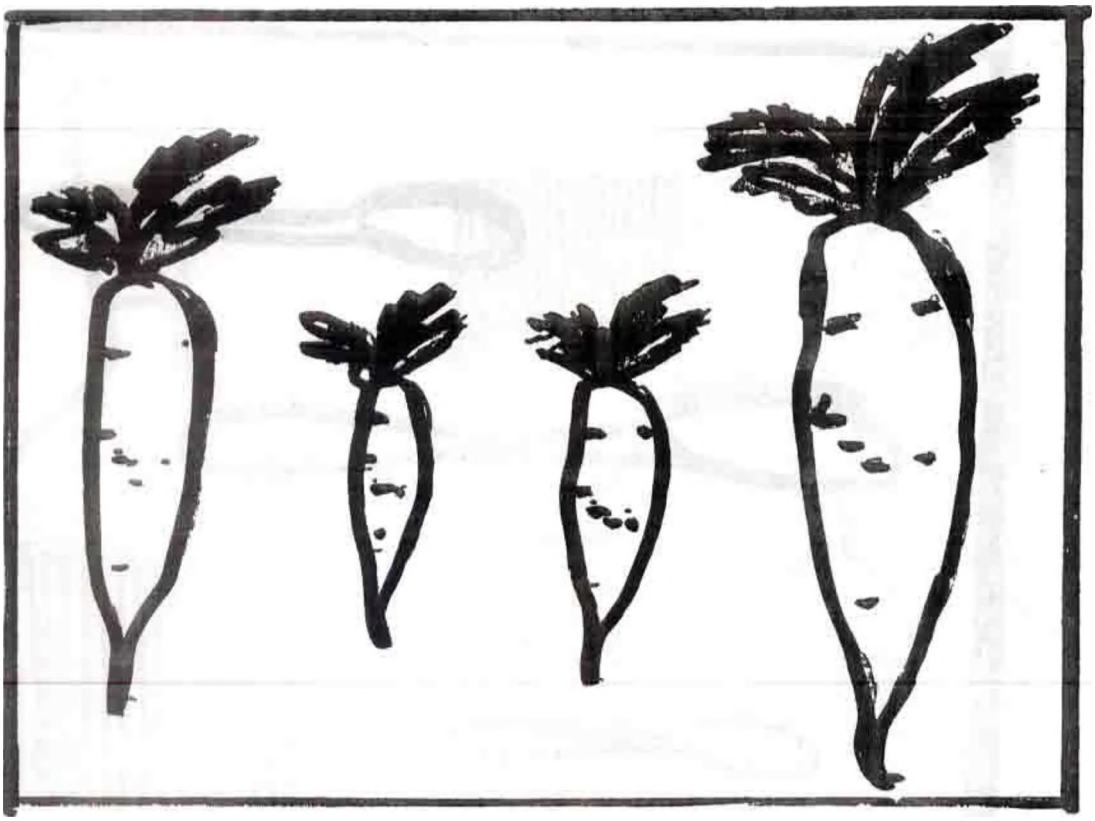


g

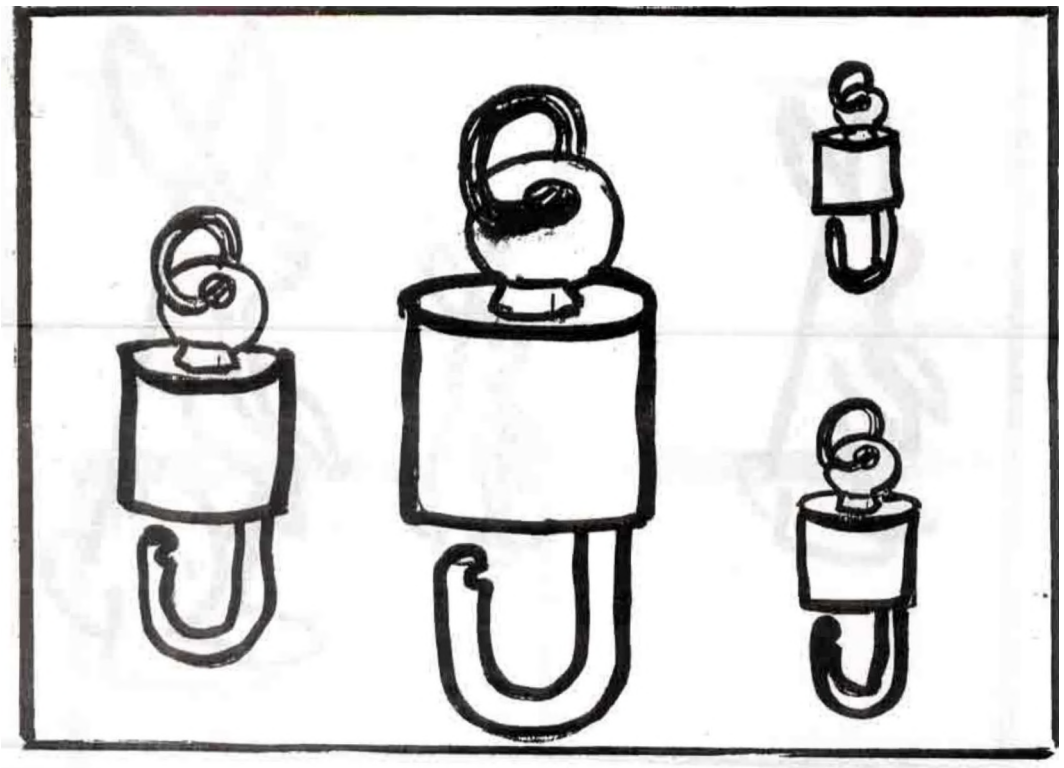
104,1104/

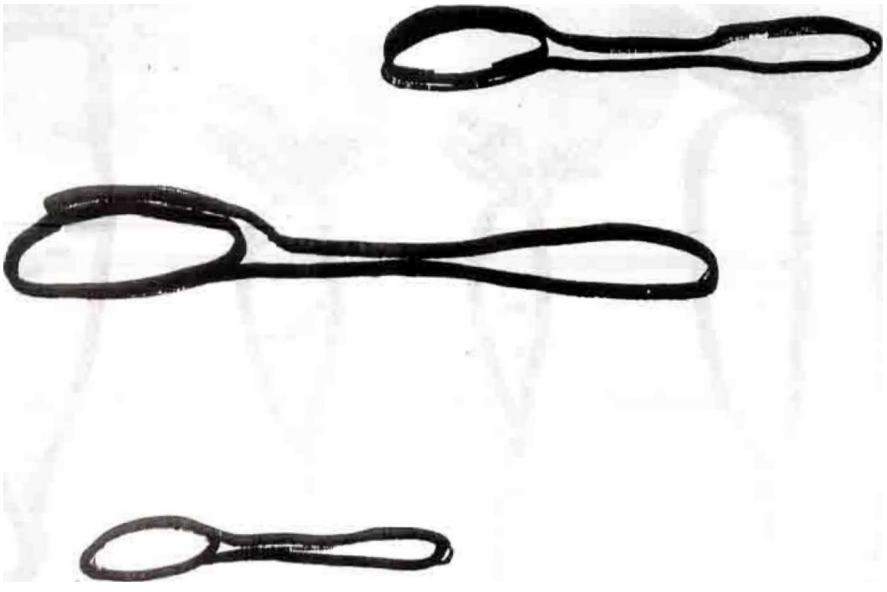
In each section find the samllest and the largest item and put a ring around each, or colour each I



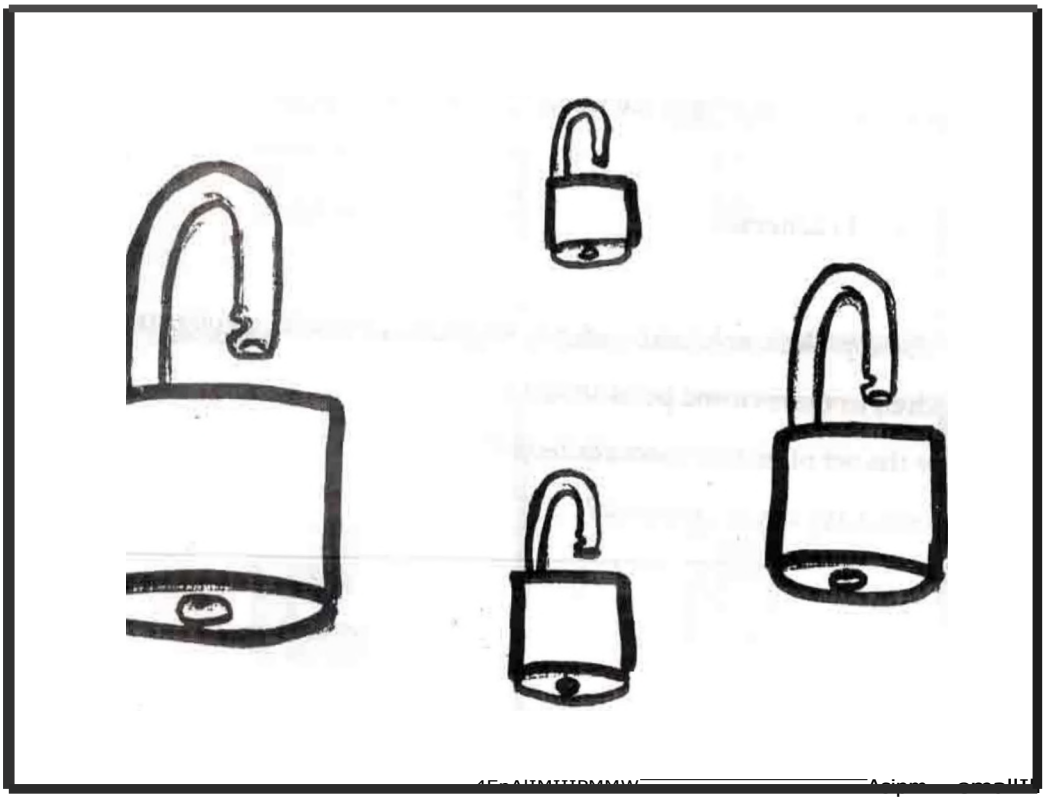


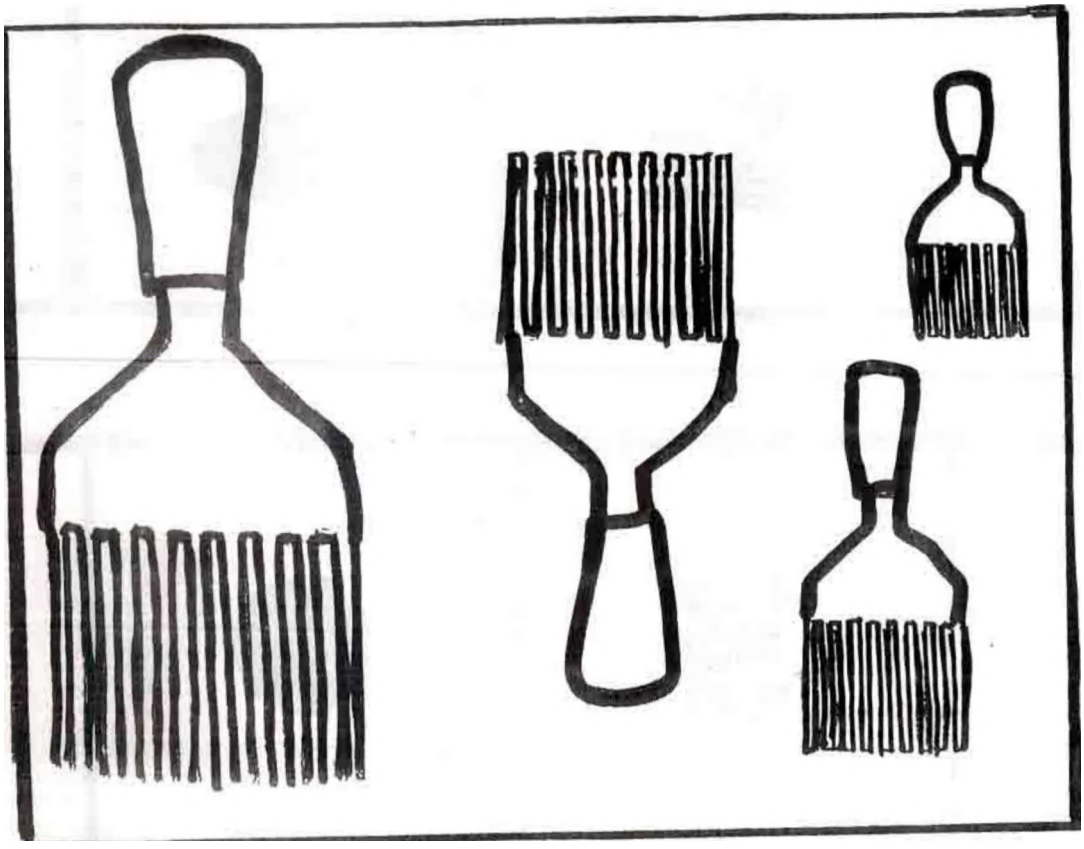
In each section find the samllest and the largest item and put a ring around each, or colour each I





Colour those figures which are the same size. Then count them. I





Aim IV

To provide opportunities to observe similarities and differences of colour among objects which have the same size and shape.

Instructions for Teachers

- Select visually clear coloured pictures of fruits/animals/birds/objects and ask children to observe and point them out
- How are the set of pictures same/different?
- Which ones have the same colour?

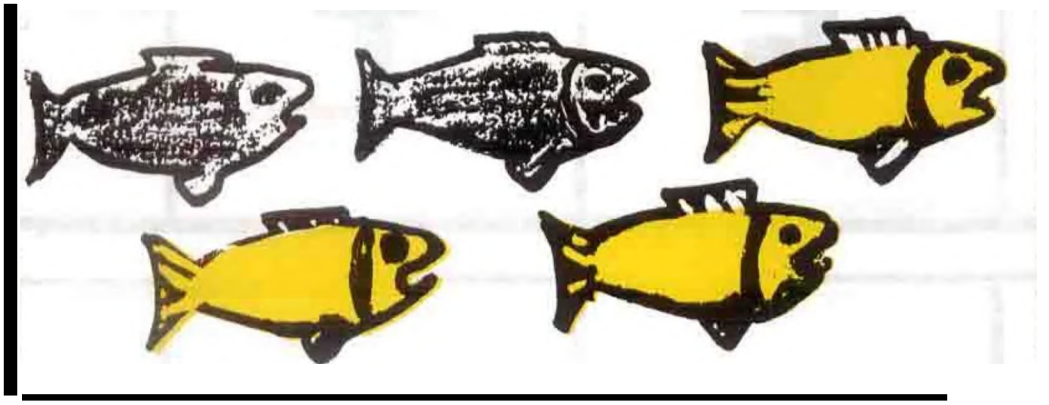
Samples

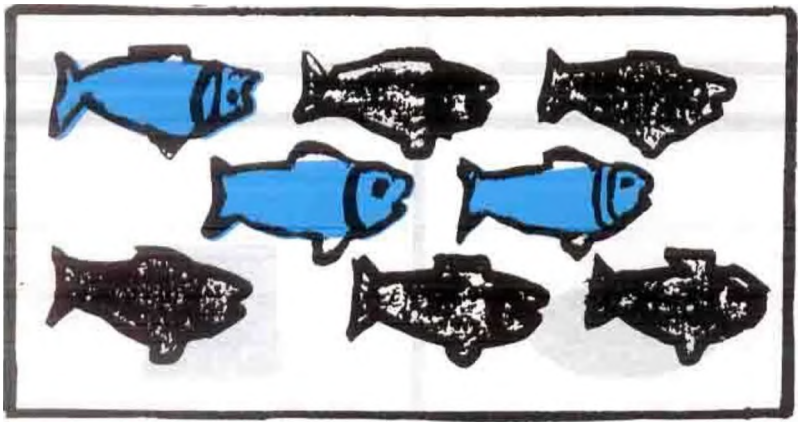
Pages xxi to xxii

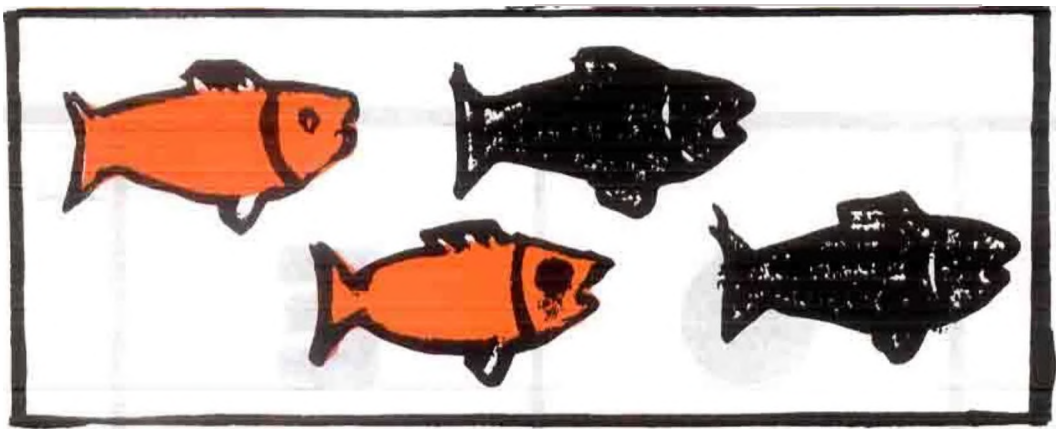
Which figures are the same colour? Mark them in each row.

T	E	7	T
T	E	E	T
△	410	■	●
●	E		■

Which figures are the same colour? Mark them in each box.







Aim V

To provide opportunities to observe similarities and differences in COLOUR and SIZE among objects which have the same shape.

Instructions for Teachers

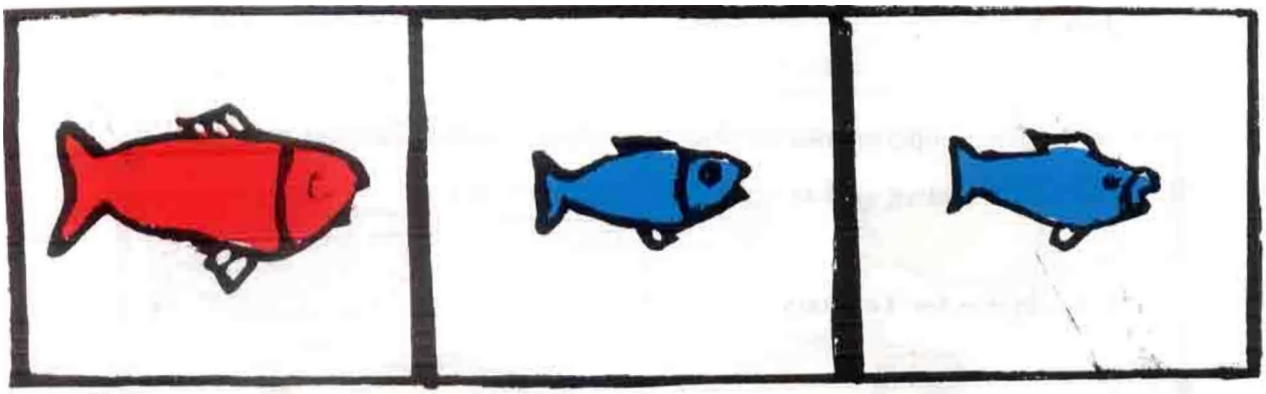
Select pictures of animals/birds/fruits/common daily wear clothing etc. and ask children to observe.

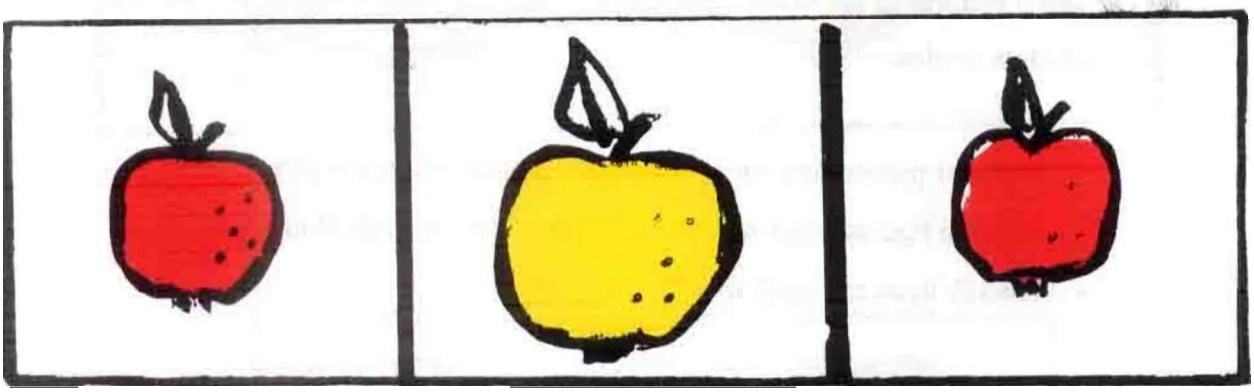
- 1-low the pictures are the same/different notice colour and size.
- Observe figures which are exactly of the same size and colour. Mark them.
- Identify large and small figures.

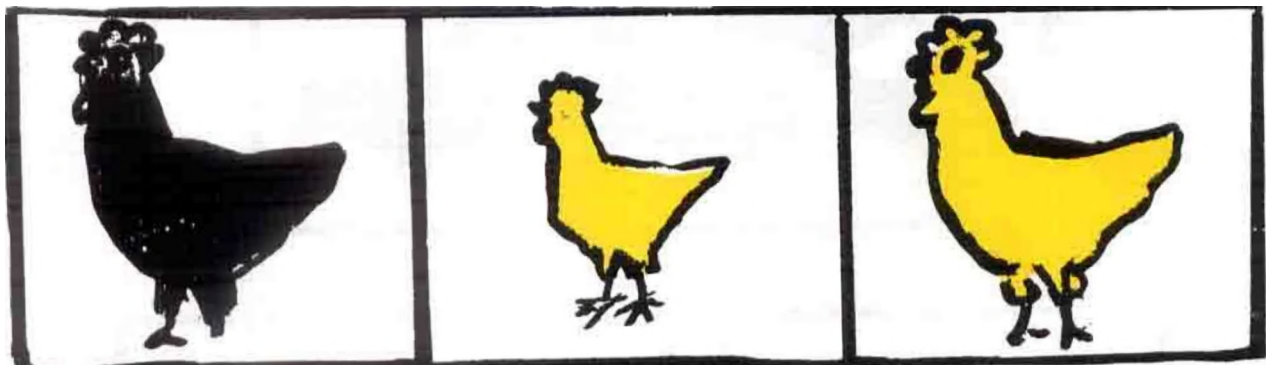
Samples

Pages xxiv to xxviii

Mark those figures which <u>are</u> the same size in size and colour.



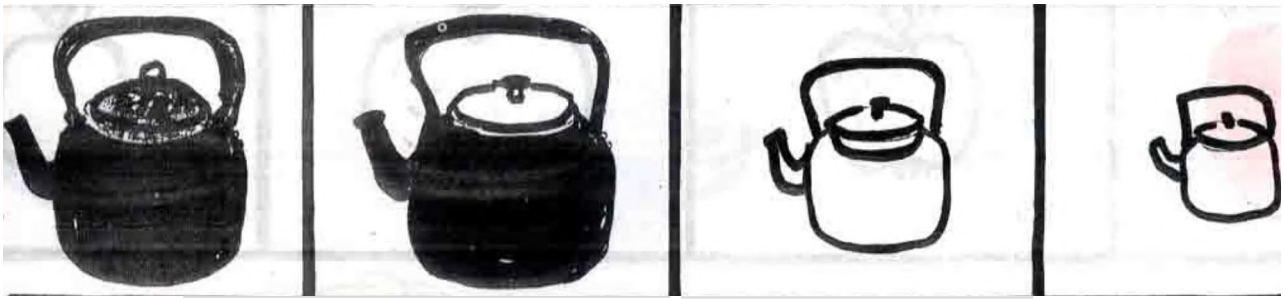


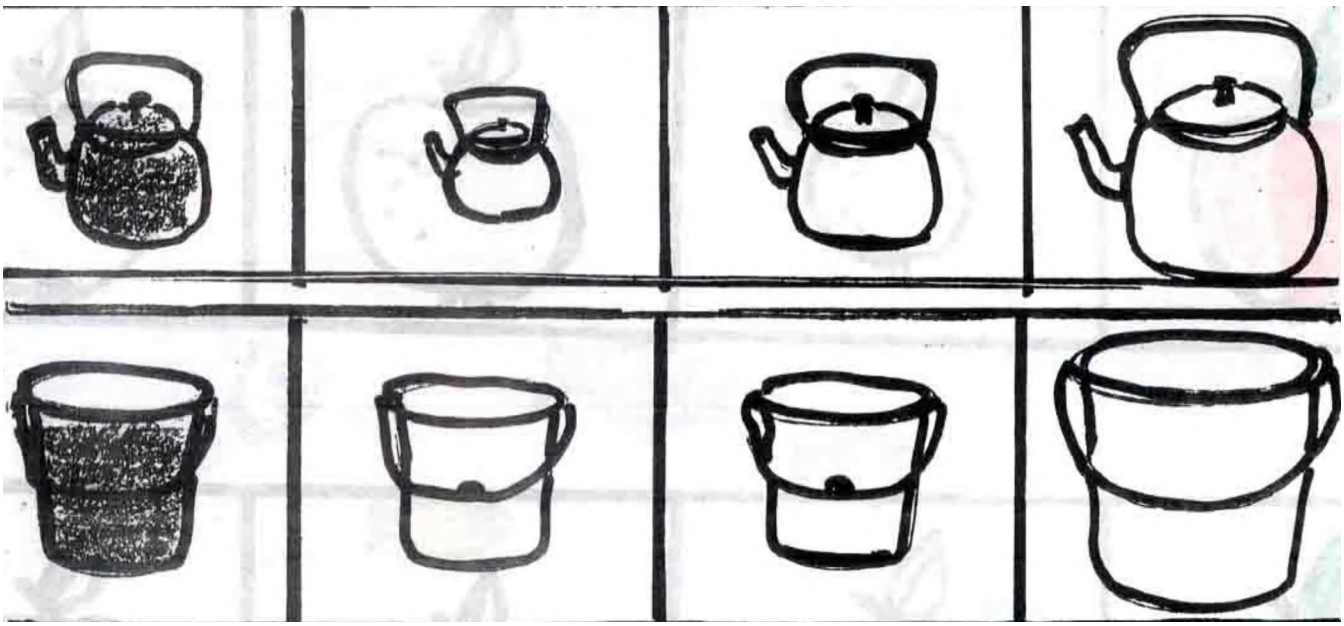


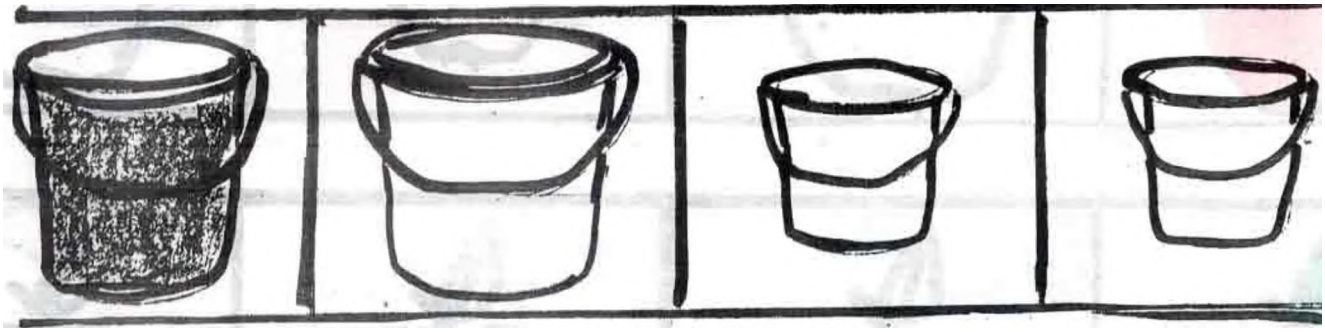
MN'

'atingle

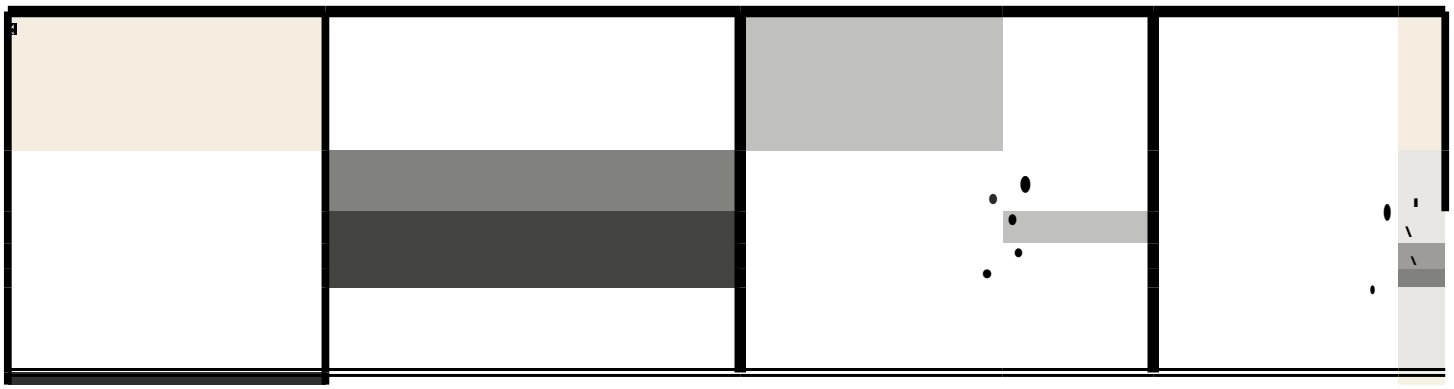
Shade only the figures which are of the same size as the first **one in the row I**

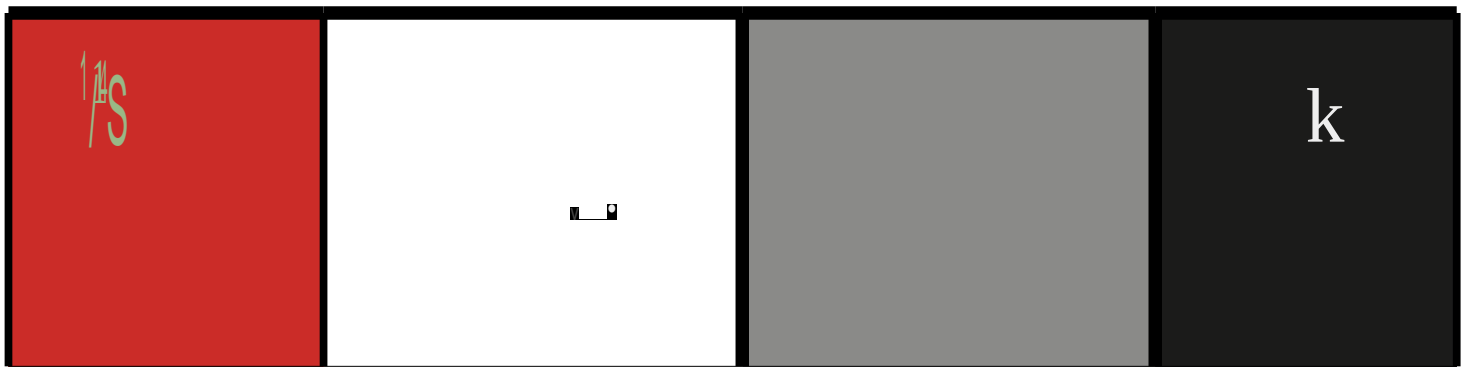


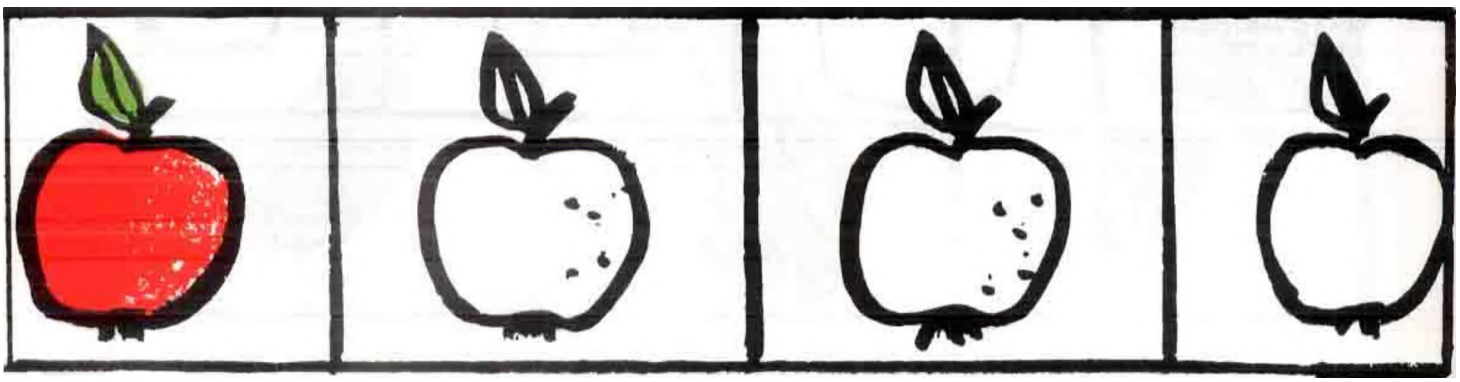




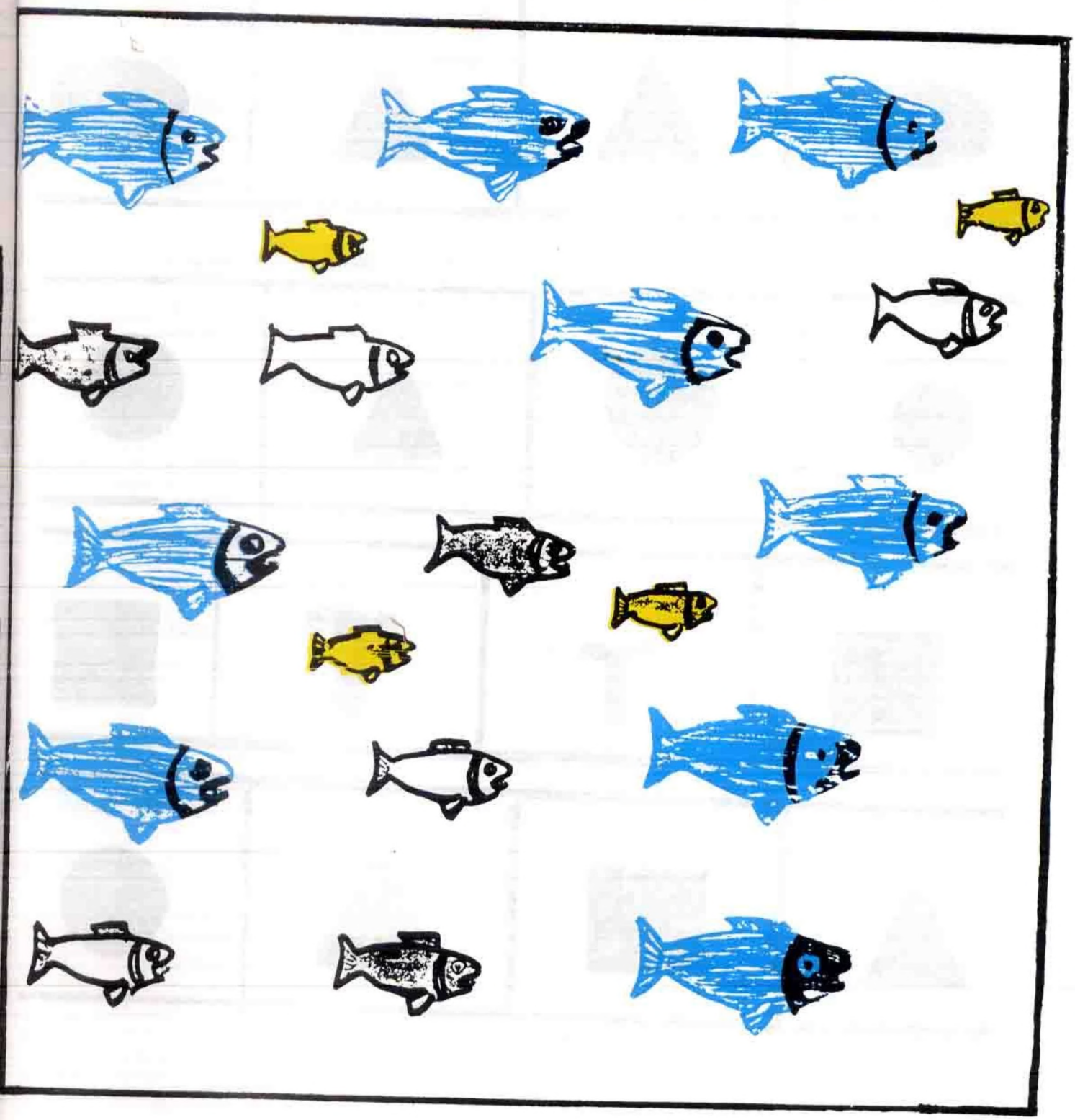
Mark the large and small apples in each row. Then colour them.





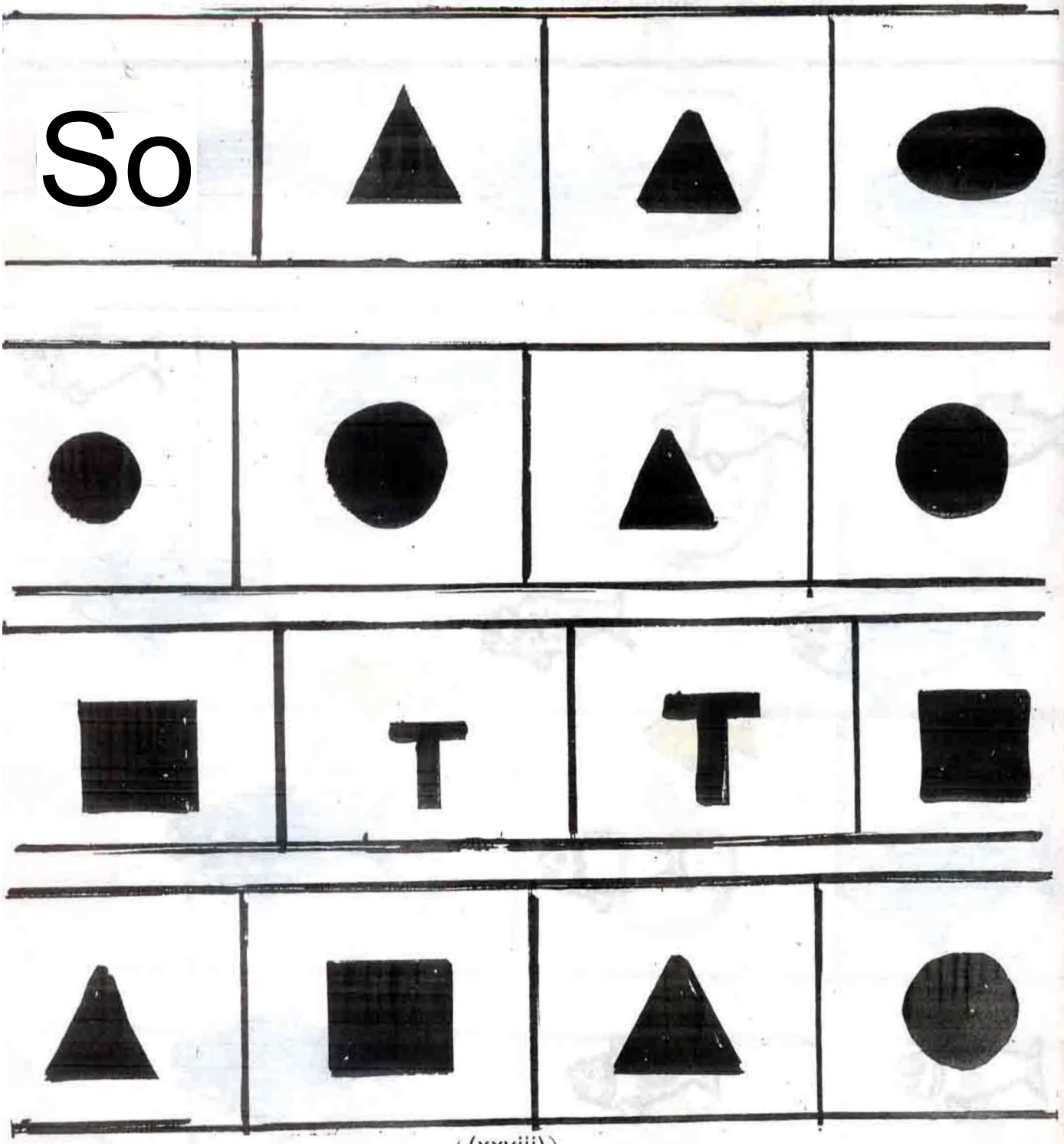


Mark those figures which are exactly the same in size



Mark those figures which are the same in size

So



Aim VI

To provide opportunities for the development of visual discrimination skills in finding similarities and differences among pairs of shapes.

Instructions for "teachers

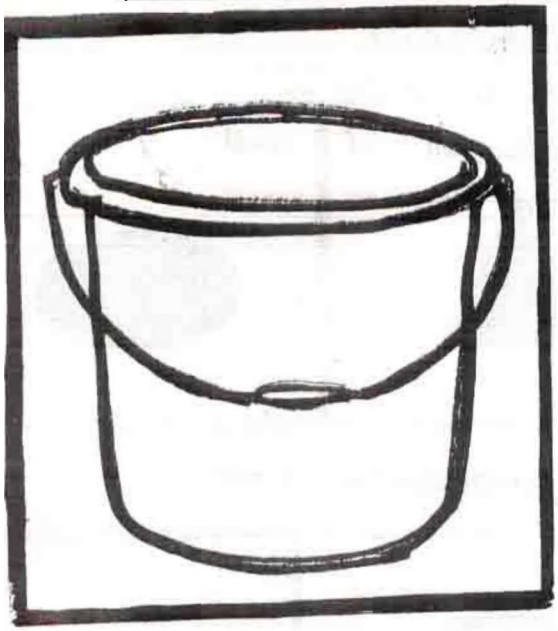
Arrange (in boxes) pairs of pictures which are apparently dissimilar but also **have a commonality and ask the children to point out:**

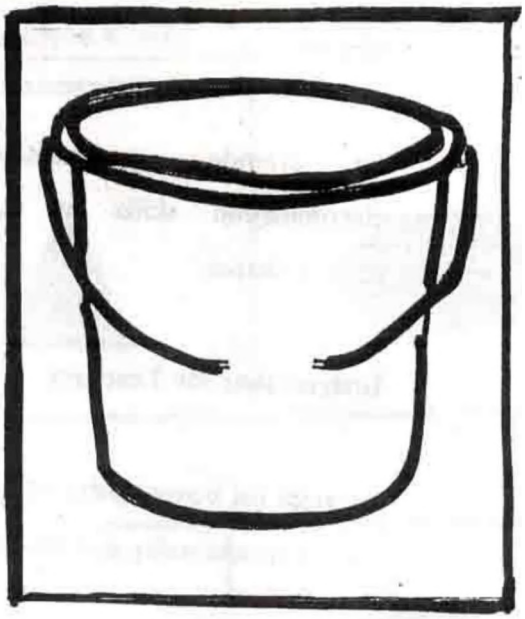
- **The similarities and differences in** shape, size and colour.
- How are these the same?
- How are these different?

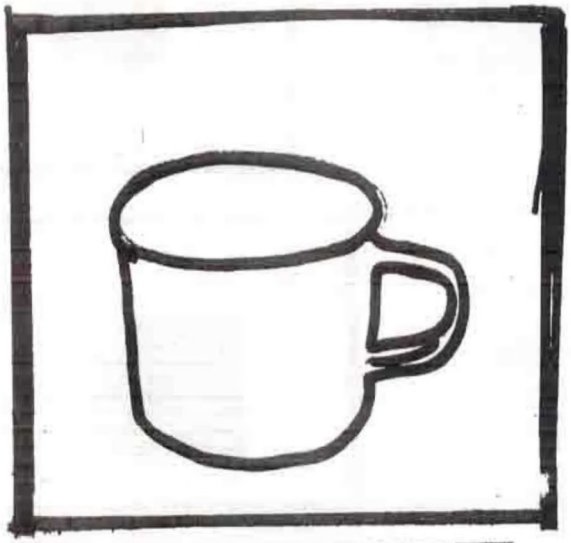
Samples

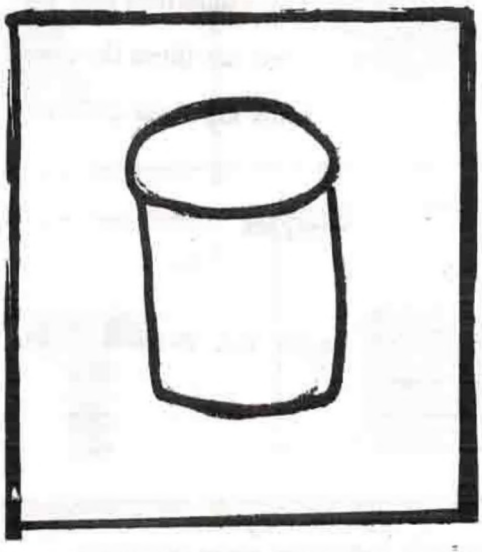
Pages xxx to xxxii

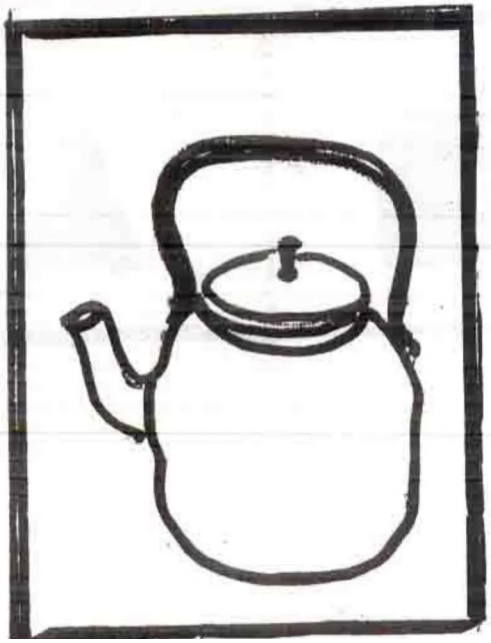
Find the missing parts and complete the pictures.

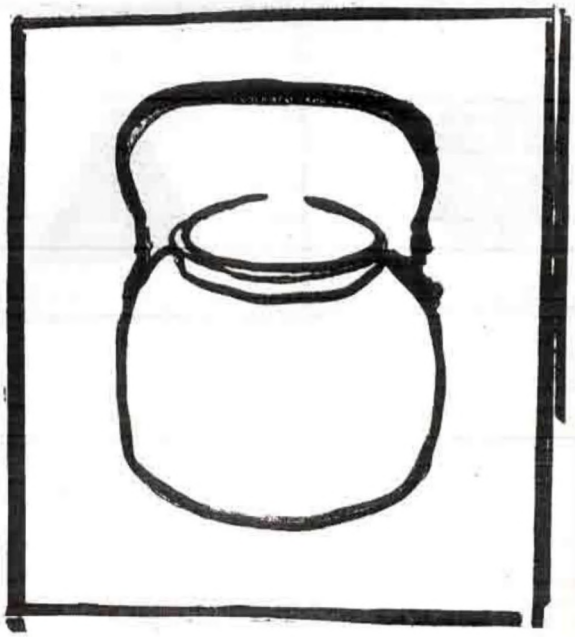




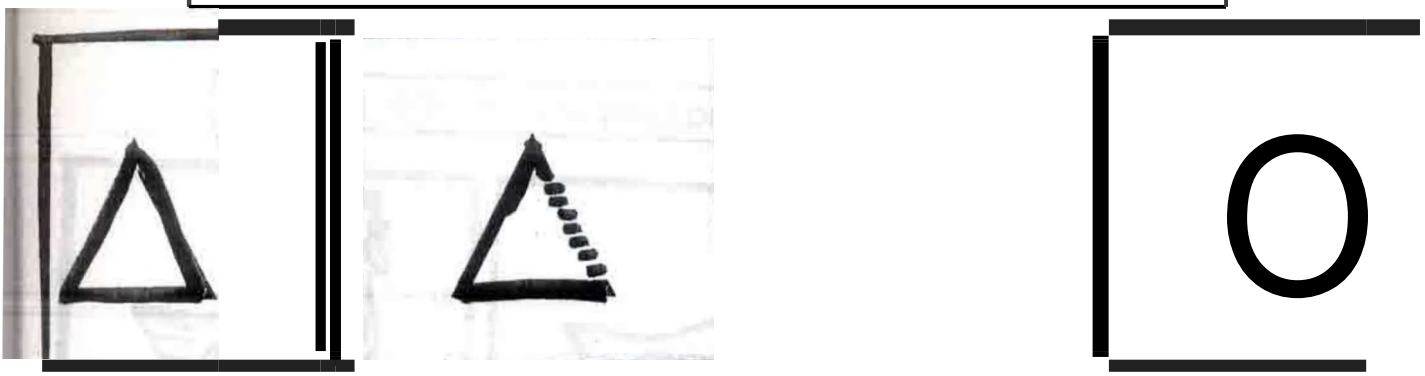


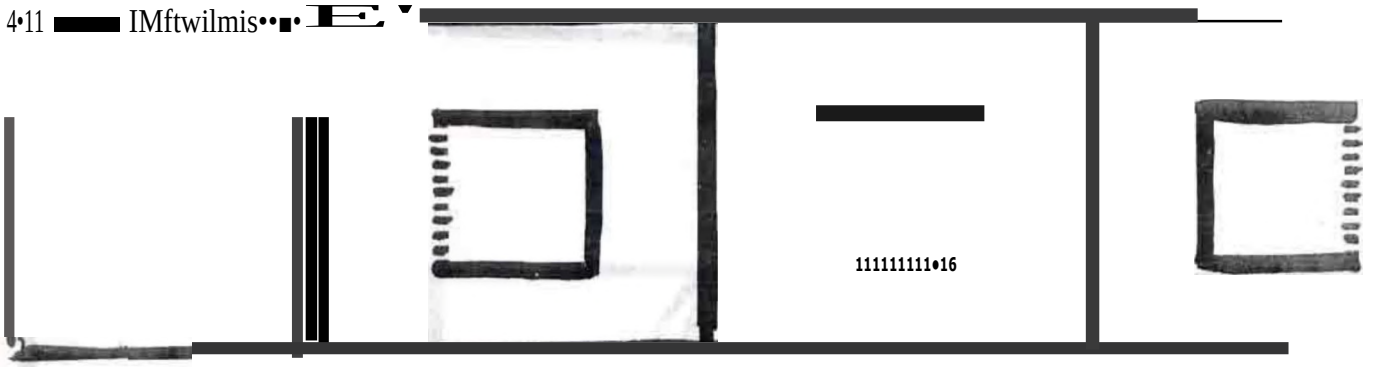


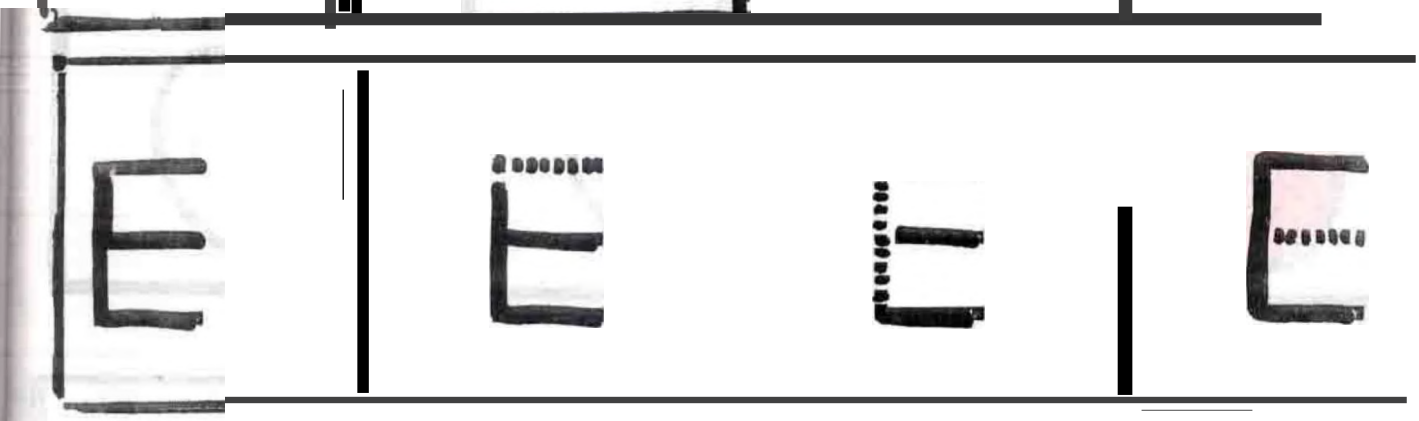


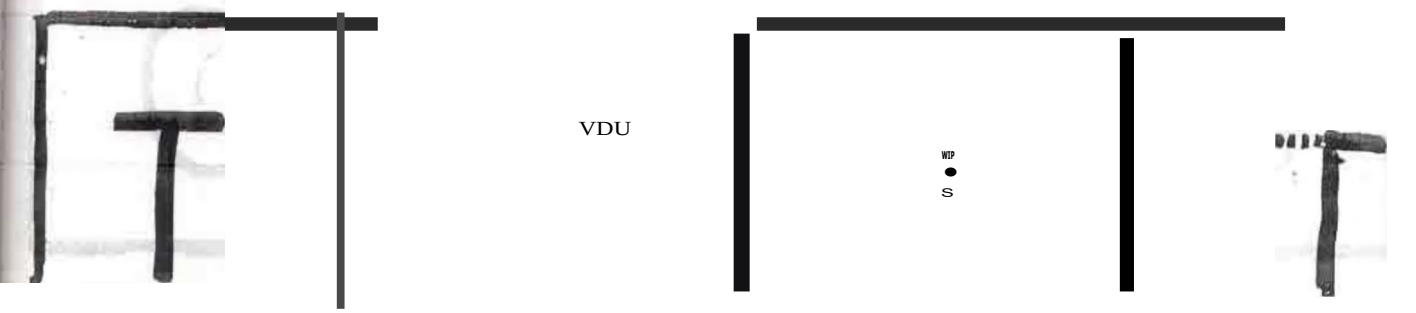


Look at the first figure in each row and complete the other figures.

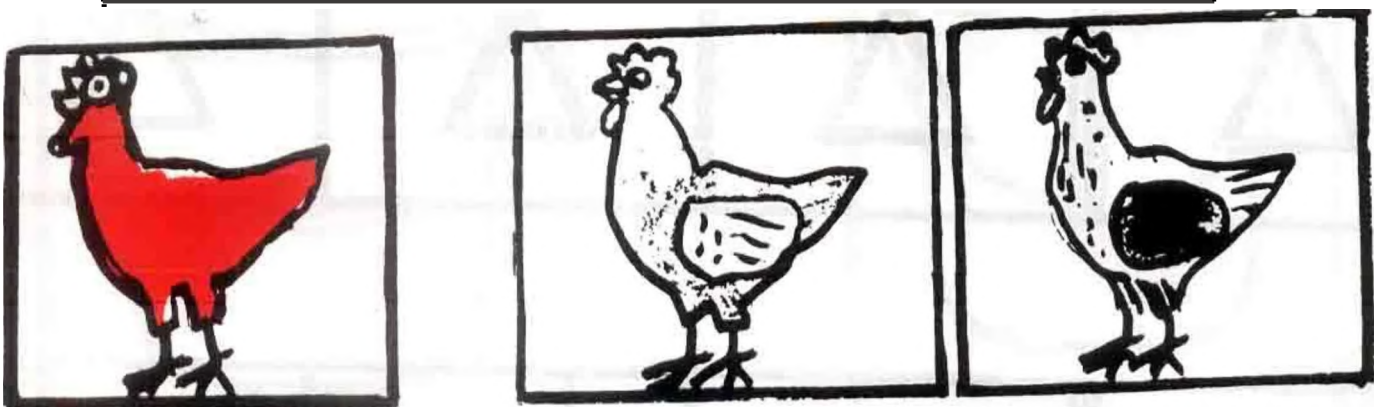


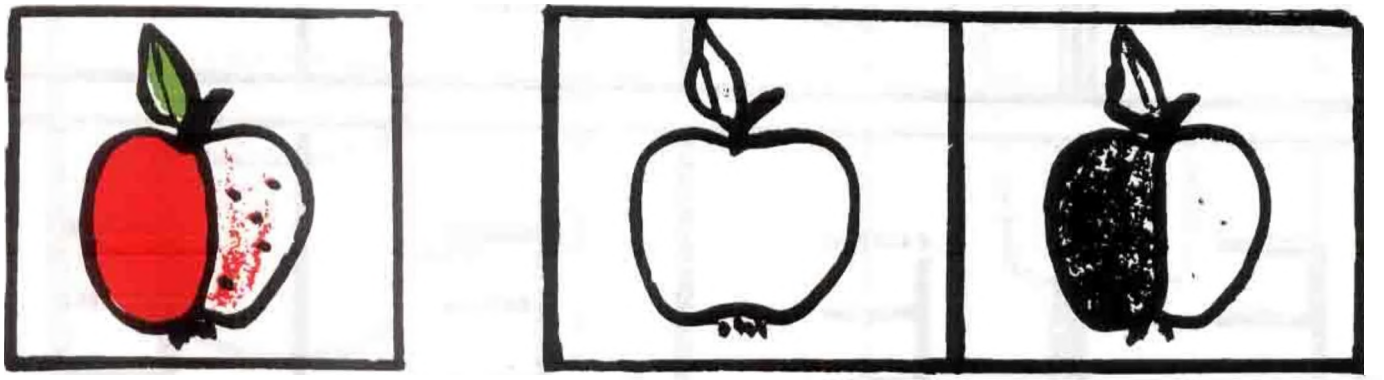


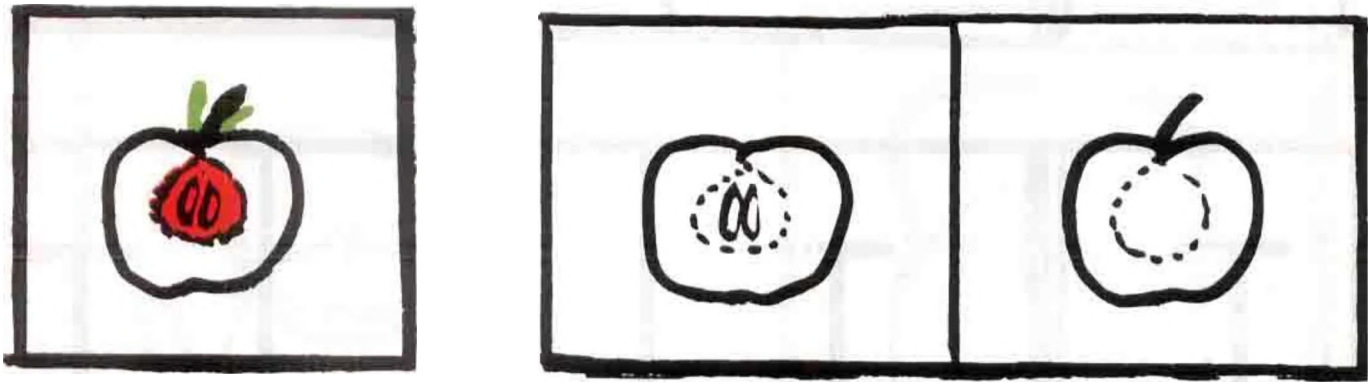




Look at the first picture in each row and complete the other pictures. I







Aim VII

To provide opportunities to develop greater perception skills in observing details in pictures.

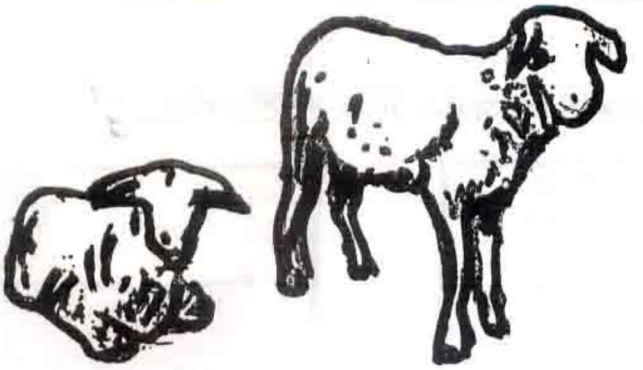
Instructions for the Teachers

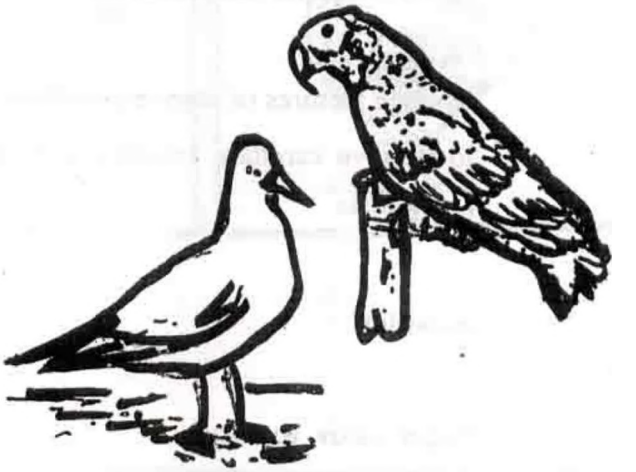
Arrange pictures of objects/animals/birds with parts missing. Ask the children to observe carefully compare and find the missing parts and complete the pictures.

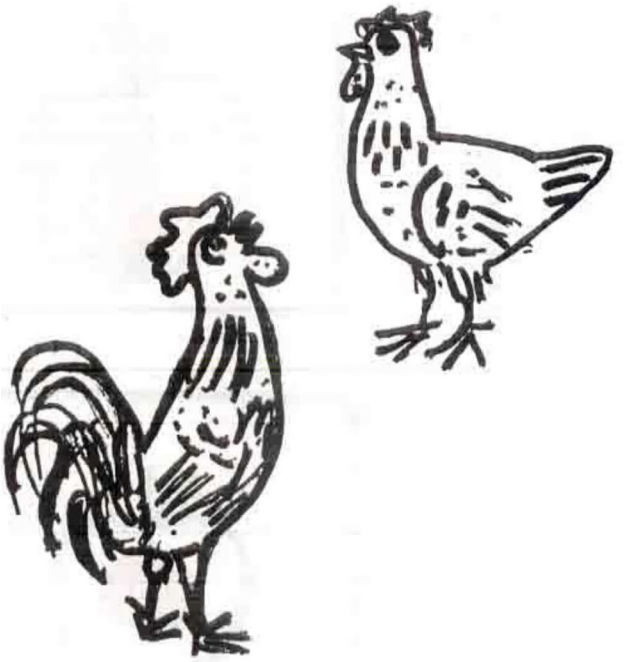
Samples

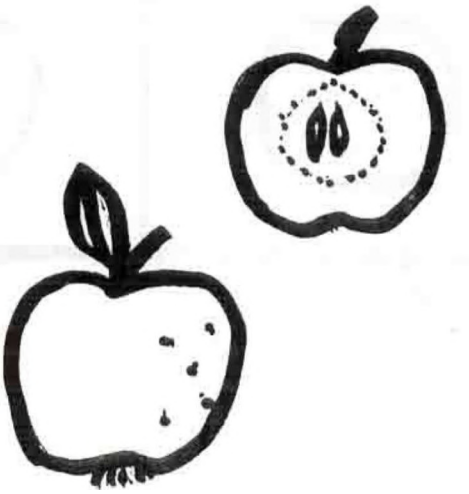
Pages xxxiv to xxxvii

How are these the same? How are these different?

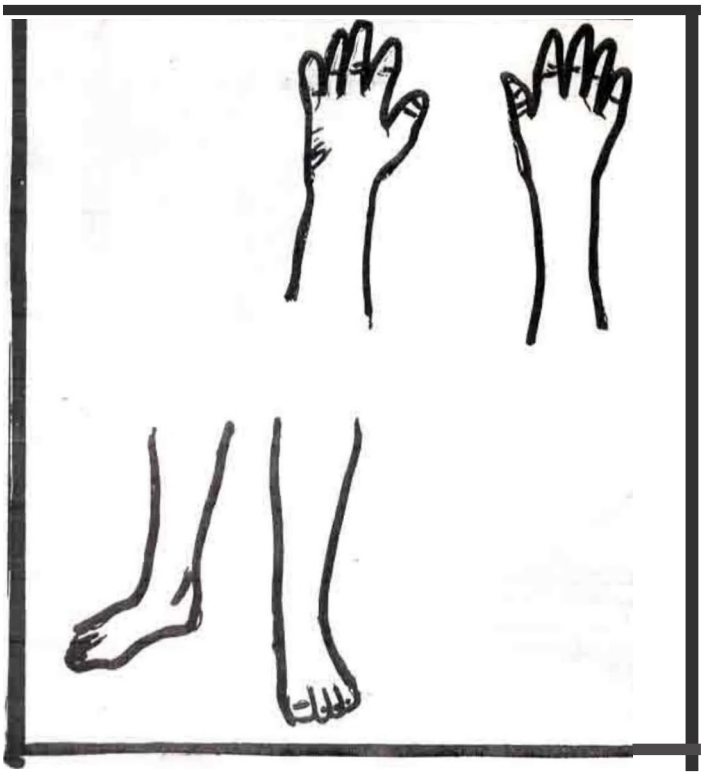


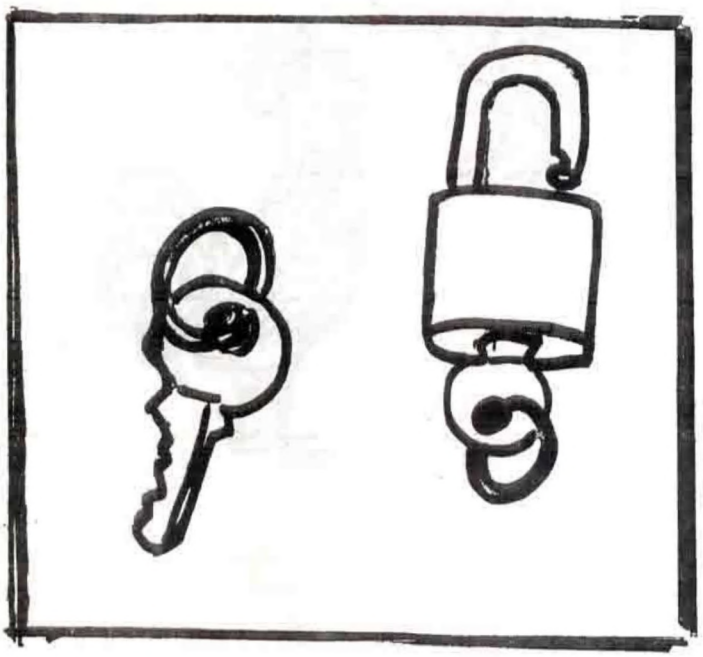


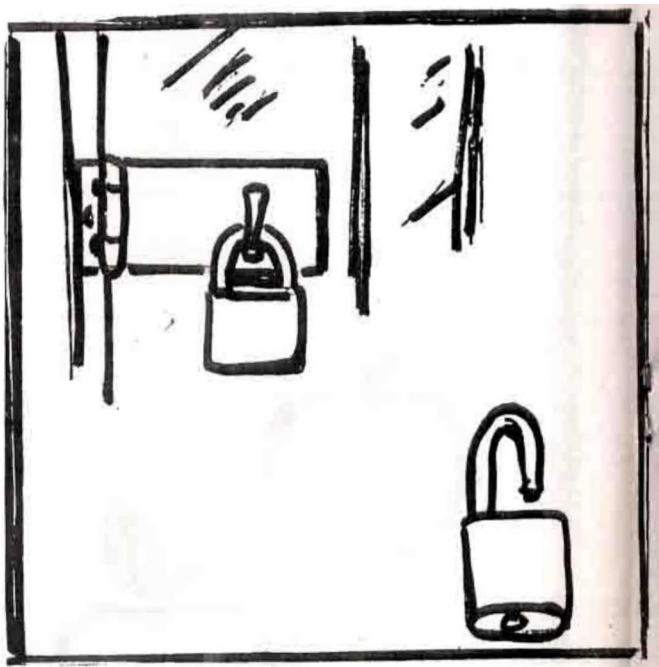




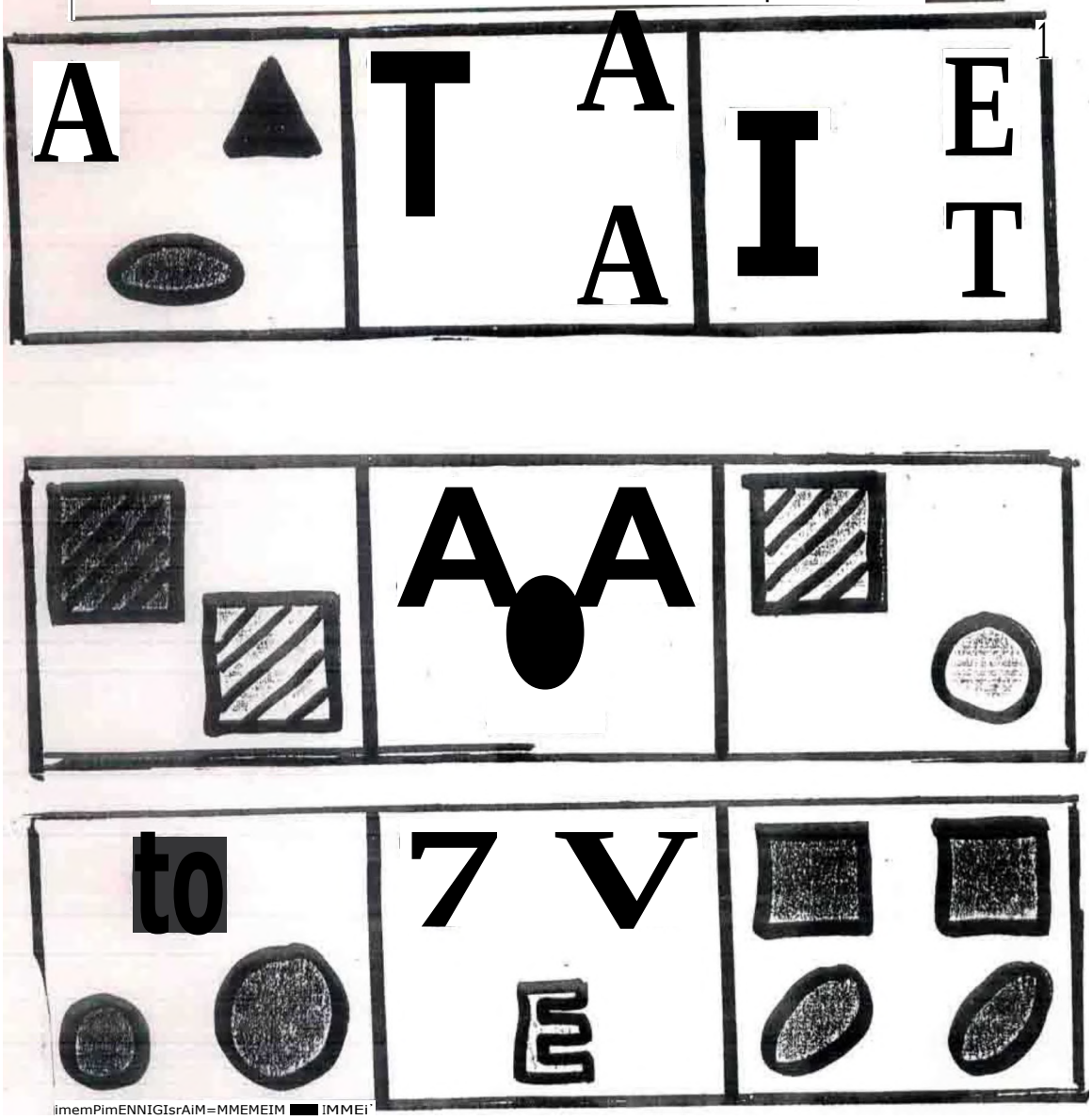
How are these same? How are they different?







Point out the similarities and differences in shape and, size



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