Manual on Curriculum adaptation for Secondary Level

Chapters of Manual on Curriculum adaptation for Secondary Level

PREFACE

This manual on curriculum adaptation was developed to facilitate the inclusion of children with special needs in the general education system. The purpose of this manual is to assist teachers in developing programs and enable students with special needs to meet their academic goals. The mandate of differentiated instruction and inclusive education is outlined in the RPWD Act and RTE act, and the UNCRPD framework to be followed for implementation of educational services.

The Secondary and Senior Secondary years of schooling are profoundly important; as it represents the terminal point of formal schooling and prepares young people for the work force. For children with special needs, learning experiences at this stage of education becomes important for their future living in society. Thus, it is far more significantly important to differentiate education in varying degrees according to the needs, interests and aptitudes of the students.

The manual is one of the first specific and concrete document to help teachers raise their awareness and ability to respond to the diverse curriculum needs of their students. The purpose of this book is to serve as a guide for the modification and implementation of curriculum adaptation for students with different disabilities; by offering you exemplars/activities/Lesson plans and suggestions which pinpoints the recommendations for adaptations for different disability areas; which can assist teachers in their classroom teaching as per the specific learning needs of their students. This manual also includes how to handle other issues like life Skills, Pear Pressure, Sex Education Gender Equity in inclusive setup among these children .This book also cover the Salient features of Rights of Persons with Disabilities Act, 2016 e.g Disabilities covered , Rights and entitlements, Guardianship, Establishment of Authorities and Penalties for offences.

I would like to express my sincere thanks to the contributors and disability experts for their efforts in reviewing, editing and developing of this manual. The teachers who will be using it would need to innovate and study more relevant documents to widen their knowledge; for effective educational inclusion of children with disabilities. I extend my sincere gratitude to NCERT, SCERT/DIETs and other agencies for their contribution in bringing about these manuals. Thank you!

Dr. Anamika Singh

1. Inclusive Education and Inclusive Classrooms

What is Inclusive Education and Inclusive Classrooms
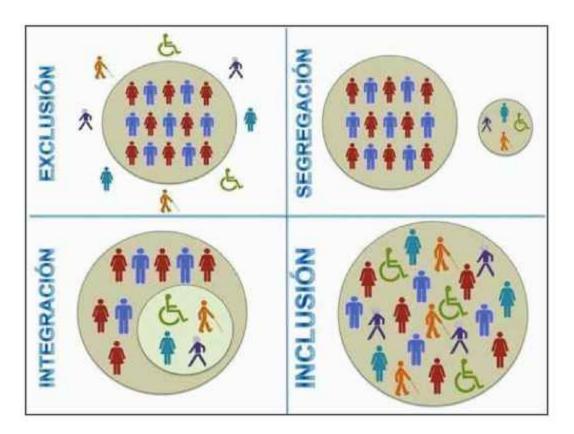
Inclusive education means that all students attend and are welcomed by their neighbourhood schools in age-appropriate, regular classes and are supported to learn, contribute and participate in all aspects of the life of the school.

Inclusive education is about how we modify attitudes bring about awareness regarding CWSN special needs develop and design our schools, classrooms, programs and activities so that all students learn and participate together.

Inclusive education happens when children with and without disabilities participate and learn together in the same classes. Research shows that when a child with disabilities attends classes alongside peers who do not have disabilities, teaching learning become more effective.

For a long time, children with disabilities were educated in separate classes or in separate schools. People got used to the idea that special education meant separate education. But, we now know that when children are educated together, positive academic and social outcomes occur for all the children involved.

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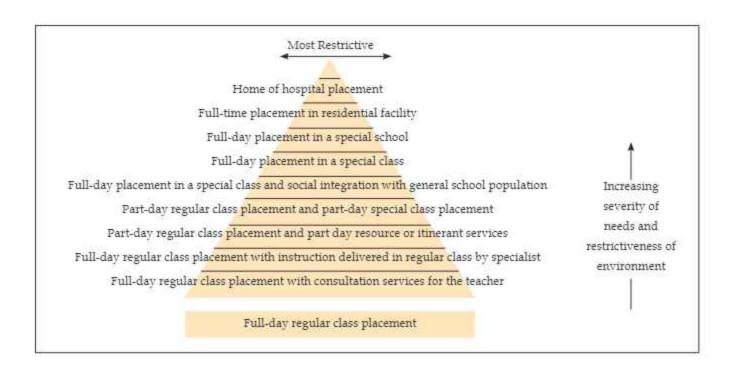
We also know that simply placing children with and without disabilities together does not produce positive outcomes. Inclusive education occurs when there is ongoing advocacy, planning, support and commitment.

Inclusion in education is an approach to educating students with special educational needs. Under the inclusion model, students with special needs spend most or all of their time with to the extent of their disability, non-disabled peers. Inclusion rejects the use of special schools or classrooms to separate students with disabilities from students without disabilities.

Implementation of these practices varies. Schools most frequently use the inclusion model for selected students with mild to moderate special needs. Fully inclusive schools, which are rare, do not separate "general education" and "special education" programs; instead, the school is restructured so that all students learn together.

Inclusive education differs from the 'integration' or 'mainstreaming' model of education, which tended to be concerned principally with disability and special educational needs, and learners changing or becoming 'ready for' or deserving of accommodation by the mainstream. By contrast, inclusion is about the child's right to participate and the school's duty to accept the child and not to change the child according to the prevailing norms and practices.

Most Restrictive

Home of hospital placement
Full-time placement in residential facility
Full-day placement in a special school
Full-day placement in a special class
Full-day placement in a special class and social integration with general school population
Part-day regular class placement and part-day special class placement
Part-day regular class placement and part day resource or itinerant services
Full-day regular class placement with instruction delivered in regular class by specialist
Full-day regular class placement with consultation services for the teacher

Full-day regular class placement

Increasing severity of needs and restrictiveness of environment

A premium is placed upon full participation by students with disabilities and upon respect for their social, civil, and educational rights. Feeling included is not limited to physical and cognitive disabilities, but also includes the full range of human diversity with respect to ability, language, culture, gender, age and of other forms of human differences.

Why Is Inclusion Important?

Preparation for Adult Living—The goal of education is to prepare individuals to be contributing members of society. Segregated settings often cannot prepare individuals to function in integrated community and work environment because they do not afford those with or without disabilities opportunities to develop the attitudes, values and skills required to get along with one another as interdependent members of society. By attending their local-schools, students with disabilities can practice skills in the actual community setting where they're needed and they can then develop a sense of belonging.

- Improved Learning Through Peers and Greater Exposure—Students with disabilities who are placed in regular classes have opportunities to grow socially and academically through peer models and exposure to a greater variety of experiences.

- Growth for Peers—Through having students with disabilities in their schools and classes, peers without disabilities learn to develop

skills in dealing with others who are different from themselves. This experience often leads to growth in their self-esteem and interpersonal behaviours, paving the way for the formation of rewarding adult relationships with a variety of people in community, home, and workplace settings.

- Effective Use of Resources—When students with disabilities are educated in regular classes, special educators provide support in that setting. This affords students the opportunity to learn from special educators, regular classroom teachers, and classmates. The entire class benefits from the collaboration of regular and special educators: some regular educators feel they have learned from special educators more effective ways to assist all students in the class.

- Friendship Development—Inclusion affords students with and without disabilities opportunities to become friends with one another. Some of the friends that students with disabilities make in school today will be their co-workers and fellow community members as they reach adulthood.

- Acceptances of Differences — As students with and without disabilities interact as classmates and friends, opportunities arise to break down barriers and help people to understand each other better. Inclusion can help us to create a society that accepts and values persons with and without disabilities as contributing members in all aspects of community life.

- Team Building—Successful inclusion of students with disabilities requires greater collaboration between regular and special education personnel. This teamwork can result in improved instruction for students and improved staff morale. The parents of the students with disabilities also become valued members of this collaborative team, sharing their dreams and aspiration for their children's for their children's futures.

- Focus on Strengths—Inclusive education programs are characterized by a focus on the student's strengths, rather than the student's deficits. This emphasis enables the educators to look closely at areas where the students are then used to facilitate positive interaction with classmates.

Benefits of Inclusive Education

All children benefit from inclusive education. It allows them to:

- Develop individual strengths and capacities, with high and appropriate expectations from each child.

- Work on individual goals while participating in the classroom activities with other students of their own age.

- Involve their parents in their education and in the activities of their local schools.

- Foster a school culture of respect and belonging. Inclusive education provides opportunities to learn, and accept individual differences and respect them lessening the impact of harassment and bullying.

- Develop friendships with a wide variety of other children, each with their own individual needs and abilities.

- Positively affect both their school and community to appreciate and accept diversity and inclusion on a broader level.

- All parents want their children to be accepted by their peers, have friends and lead "regular" lives. Inclusive settings can make this vision a reality for many children with disabilities.

- When children attend classes that reflect the similarities and differences of people in the real world, they learn to appreciate diversity. Respect and understanding grow when children of differing abilities and cultures play and learn together.

- Schools are important places for children to develop friendships and learn social skills. Children with and without disabilities learn with and from each other in inclusive classes.

- In inclusive classrooms, children with and without disabilities are expected to learn to read, write and do math. With higher expectations and good instruction children with disabilities learn academic skills.

- Because the philosophy of inclusive education is aimed at helping all children learn, everyone in the class benefits. Children learn at their own pace and style within a nurturing learning environment.

An **inclusive classroom** is a general education **classroom** in which students with and without disabilities learns together. It is essentially the opposite of a special education **classroom,** where mostly the same kind of students with disabilities are then.

Principles for quality inclusive education:

- **All children should be treated equally**-Inclusive education is based on the simple idea that every child and family is valued equally and deserves the same opportunities and experiences. Inclusive education is about children with disabilities - whether the disability is mild or severe, hidden or obvious - participating

in everyday activities, just like they would have if their disability were not present. It's about building friendships, membership and having opportunities just like everyone else.

- **All children learn in different ways**-Inclusion is about providing the help children need to learn and participate in meaningful ways. Sometimes, help from friends or teachers works best. Other times, specially designed materials or technology can help. The key is to give only as much help as needed.

- **It is every child's right to be included**-Inclusive education is a child's right, not a privilege. The Individuals with Disabilities Education Act clearly states that all children with disabilities should be educated with non-disabled children their own age and have access to the general education curriculum.

Making Inclusion a Reality

What you can do to promote inclusion for your child:

1. Share your child's strength and weakness with the class teacher.

2. **Encourage your child to participate in activities where he/she can meet children of his/her same age with different abilities.**

   When looking for activities, consider your child's interests. The local school, library, and recreation or community centres are good places to check out. You also may want to consider national organizations that encourage diversity, such as 4-H Clubs or Girl Scouts of America.

3. **Search the Internet for activities or organizations that your child may want to join.**

   Two community Web sites with numerous resources are The Family Village and Kids Together: Information for Children and Adults with Disabilities.

4. **Help your child develop friendships with classmates or other neighborhood children.**

   Set up opportunities for your child to be with children he likes or children who show an interest in him. Teach your child how to make and keep friends.

5. **Share your goals and expectations for your child.**

   Before you meet with the school and decide upon your child's Individualized Education Plan (IEP), meet with his teachers, therapists

and others to discuss your goals, expectations, and future placement preferences for him.

6. **Know the rights you and your child have to an inclusive education.**
7. **Educate his peers about his special needs specially his buddy.**

What schools can do to promote successful inclusive education:

1. **Consider inclusive education first.**

   Special education services can be provided in many different settings. Schools are required to consider the general education class before considering any other setting for your child to receive special education services.

2. **Support each child's learning.**

   Teachers support learning in inclusive classrooms in three ways. First, they teach so that students with differing abilities and learning styles can understand and participate. Second, they modify assignments when they are too difficult. Third, they model respect and encourage friendships.

3. **Become your child's advocate.**

   It takes time and energy to make inclusion happen in a school that is resistant to change. Stay focused on what you believe is best for your child. Listen carefully to the arguments against your child's inclusion in a general education class and use what you learn to advocate for change. For example, if you are told that your child is not ready for the general education class, ask what supports could be provided to help make her successful in the class.

Principles of inclusion and necessary resources

Inclusion is not designed to reduce students' needs, and its first priority may not even be to improve academic outcomes; in most cases, it merely moves the special education professionals (now dual certified for all students in some states) out of "their own special education" classrooms and into a corner of the general classroom or as otherwise designed by the "teacher-in-charge" and "administrator-in-charge". To avoid harm to the academic education of students with disabilities, a full panoply of services and resources is required (of education for itself), including:

- Adequate supports and services for the student
- Well-designed individualized education programs

- Professional development for all teachers involved, general and special educators alike
- Time for teachers to plan, meet, create, and evaluate the students together
- Reduced class size based on the extent of the student needs
- Professional skill development in the areas of cooperative learning, peer tutoring, adaptive curriculum
- Collaboration between parents or guardians, teachers or Para educators, specialists, administration, and outside agencies.
- Sufficient funding so that schools will be able to develop programs for students based on student need instead of the availability of funding,

Teachers use a number of techniques to help build classroom communities:

- Using games designed to build community
- Involving students in solving problems
- Sharing songs and books that teach community
- Openly dealing with individual differences by discussion
- Assigning classroom jobs that build community
- Teaching students to look for ways to help each other
- Utilizing physical therapy equipment such as standing frames, so students who typically use wheelchairs can stand when the other students are standing and more actively participate in activities
- Encouraging students to take the role of teacher and deliver instruction (e.g. read a portion of a book to a student with severe disabilities)
- Focusing on the strength of a student with special needs
- Take breaks when necessary
- Create an area for children to calm down
- Organize student desk in groups
- Create a self and welcoming environment
- Set ground rules and stick with them
- Help establish short-term goals
- Design a multi-faced curriculum

- Communicate regular with parents and/or caregivers
- Seek support from other special education teachers

Stake holders

Inclusion is a team work of the whole school with the class teacher accompanied by the following support services to meet the specific needs of the CWSN.

Personnel helpful in proving these services:

1. Parents of CWSN.
2. Peers.
3. Specialist Teachers.
4. Medical Practitioner.
5. Counselor.
6. Occupational Therapist.
7. Physiotherapist.
8. Volunteers.

Evaluation in Inclusion

Evaluation is a continuous process occurring in every type of programme. Evaluation of learners must be flexible in an inclusive setup because the common procedures relaxation in terms of time and number of problems should be there.

As in the 2013 evaluation, two additional evaluation questions informed this evaluation:

- How effectively does the school support the presence, participation and engagement of students with special education needs?
- How effectively does the school promote achievement & potential of students with special education needs?

Challenges in this Evaluation

Students with special education needs are not a homogenous group, making it difficult to judge a school's overall inclusiveness. It is possible that schools may provide well for children with some types of special education needs and not for others.

2. Rationale of Curriculum Adaptation at Secondary Level

IEDSS — centrally sponsored scheme of Inclusive Education of the Disabled at Secondary Stage is a government's initiative towards providing secondary education to children with special needs, which enables all students with disabilities completing eight years of elementary schooling an opportunity to complete four years of secondary schooling in an Inclusive and enabling environment.

Curriculum adaptation is an ongoing dynamic process that modifies and adapts the prescribed program of studies to meet the learning requirements of a student with special needs. It enables the teaching team to welcome learners of all abilities and ensures that every student is challenged to learn.

According to King-Sears (2001), adaptation is a modification to the delivery of instructional methods and intended goals of student performance that does not change the content but does slightly change the conceptual difficulty of the curriculum. Adaptations of curriculum is a concept that usually require more teacher effort and time rather than simply changing instructional methods and strategies or access as in an accommodation, but it is a goal-driven process whereby teachers usually first need to state specifically the intended goals for individual learners, like providing individual learner activities, individual homework and assessments or

evaluations, and further using adapted or different instructional materials and strategies and activities for individual learners needs. Adaptations may be practices in inclusive classrooms often occur when teachers differentiate instruction especially when teachers decide to conduct lessons, mathematics or writing, which meet individual learner's unique needs by having work on adapted assignments. Under these conditions, learners with special needs may work on their assignment in small groups with the support of the teacher, King-Sears (2001) suggests that a variation of this type of lesson can be providing learners with special needs fewer or less work and points out that reducing the amount of tasks seen in an accommodated instruction should be differentiated from that provided in adapted instruction. Learners who are visually impaired, Intellectually challenged can benefit from this arrangement whereby they may be asked to work in groups in problem solution and as they work in groups the teacher monitoring and support may also be maximized. Hence, the adaptation of curriculum may also include a slight change in conceptual difficulties that is later introduced to the learners. It is important to note that adaptation must take place within the same learning contents and must be put in place when teachers have come to a conclusion that a special needs learner is able to learn the same content knowledge as others.

In addition to the knowledge, the students gain relevant skills for optimum functioning in the 21st century (21st century skills); teaching is adapted to the diversity of the students, breaks down barriers between the school and the outside world, while making maximum, yet enlightened, use of technology to promote the teaching processes, both at the pedagogical level and at the pedagogical management level.

Why Curriculum adaptation

- Curriculum adaptation is an important form of professional development that promotes buy-in, builds understanding of key features of learning and teaching, and improves student learning.

- Select an instructional model. What matters is that there is a coherent model of teaching that guides the adaptation of materials and that also guides teaching.

- Focus the work. It's not possible to attend to all curriculum units at once, and to do so would be overwhelming and lead to shallow changes. Target lessons for deep enhancement where students can

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make sense of phenomena, data, or ideas. Identify specific science and engineering practices to integrate into these lessons.

- Follow a backward design approach to adaptation with teams of teachers working in small collaborative groups. The curriculum enhancements can be co-designed with educational researchers with curriculum development experience.

- Attend to emotions, identity, and expertise. The emotional attachment teachers may feel towards particular activities can make them challenging to give up or change. Directly address these issues, develop trust, and create a safe place where they can take risks and try new ways of engaging students in practices. Leverage teacher expertise in ways that can focus and drive the design work.

- Improve the enhancements over time. Have the teams use, study, and refine the enhancements iteratively across their classrooms.

In an age of constrained budgets and overworked teachers, adaptive learning is bringing a spark back into the classroom and completely innovating the way education is approached. The difference is made when instructional content and methods are customized to individual students to guide/facilitate learning and mastering of new concepts. This new learning style is data-driven, and takes a non-linear approach to instruction. It's able to track student progress as it teaches, adjusting its instruction accordingly and providing teachers with important data that will help them be more effective educators.

The Key Benefits of Curriculum Adaptation:

1. Faster and higher quality student progression

For teachers dealing with ever-expanding class sizes, it may seem like there are never enough hours in the day to give all of their students the individualized attention that they need. Having more students in the classroom means instructing an even wider spectrum of academic knowledge and skills, and it can be difficult to find the time to write curricula that is broad enough to address the needs of each student, let alone check in with every pupil to make sure he or she is truly understanding the lesson. With adaptive learning, teachers can use the time students spend with the computer software to address their needs one-on-one or in a small group setting.

2. Adapts to different abilities

One of the most important education innovations that has come from adaptive learning is the ability to immediately change instruction based upon a student's knowledge. As each student works with the program, the technology will pick up on what he or she is mastering or still struggling with and adjust instruction in real-time. In this way, learning is optimized because the adaptive learning program can change its approach on an individual level to make sure students are mastering concepts before moving on to more difficult material.

3. Improves understanding

When teachers are standing in front of a classroom, it can be difficult to know whether the students really 'get it.' With adaptive learning, the method and pace of instruction is customized for each individual student, which could improve their chances of truly understanding new academic concepts.

4. Engages students

Technology is a common respect in the lives of students studying in secondary & Sr. Secondary students. As a result, they are particularly tech savvy, and may become more engaged in their lessons if given the chance to spend part of class time on the computer using adaptive learning programs.

5. Allows students to work at individual paces

Think back to when you were in elementary school and most classrooms were constructed in the same way: The teacher stood up at the front, lecturing about new material, while students of varying academic abilities sat in rows of desks and attempted to digest everything all at once. When instruction is constructed in this way, all students are expected to learn at the same pace, even if they shine in different subject areas. This makes it difficult for teachers to give struggling learners the extra time they need while simultaneously challenging high-achievers and gifted students. With adaptive learning technology, students' answers are analyzed in real time and the software adjusts instruction accordingly.

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In this way, kids are able to work at different paces and achieve the best possible academic outcomes.

6. Facilitates one-on-one instruction

Speaking of blended learning, when adapted curriculum are implemented, enables the teachers to give students one-on-one instruction and individual attention. Not only does it customize the presentation and pace of new material, but it also constantly monitors and analyzes students responses, giving teachers access to invaluable data. This data gives teachers insight into whether or not students are truly grasping new concepts, and whether particular kids in their classrooms could benefit from one-on-one instruction. This individual attention can take place while other students are working with computers, or through the implementation of a rotational model of blended learning.

3. Specific Needs of Children with Special Needs @ Secondary Level

"Nothing About Us without Us" was a slogan voiced by DPI (Disabled people international) to emphasis the disability right and revolutionalize the rehabilitation process; with the ultimate goal of efforts and activities towards the empowerment of people with disability.

There are so many models available and each model/approach has its own strength and all these models have contributed in their own way in advancing the agenda of empowerment. Now the new model is cross "disability".

Cross Disabilities is an approach that does not distinguish between types of disability. In this approach focusing on particular subgroup should be avoided whenever possible because "distinction often leads the most vulnerable people to further stigmatization." It includes persons with disabilities having hidden petential abilities.

Inclusion advocates for the idea that all people should take action to freely, openly accommodate people with disabilities to participate and development to their maximum capacity without segregation and discrimination. Education is the first and foremost level of inclusion into the society which is achieved through one of the easiest ways known as 'universal design of learning'. Special education professional Gretchen

Walsh M.S. Ed., of the Academic Support Center at Notre Dame College, said that "Inclusion is important because through our diversity we certainly add to our creativity. If you don't have a diverse classroom or a diverse world, you don't have the same creative levels and I think our strength lies in our diversity."

The module is designed to identify the needs of a student with specific forms of disability which will not only interfere with the student's acquisition of training but also restricts the students participation in the school environment.

Locomotor disabilities

To better understand in lay man terms; it can be visualized as a physical impairment which is a disabling condition or other health impairment that requires adaptation. Persons with physical impairment disabilities often use assertive devices or aids for mobility such as crutches, canes, wheelchairs and artificial limbs to obtain mobility.

The physical disability the person experiences may be either congenital, or a result of injury, muscular dystrophy, cerebral palsy, amputation, multiple sclerosis, pulmonary disease, heart disease or other reasons. Some persons may experience non-visible disabilities that may include respiratory disorders, epilepsy, or other conditions.

Locomotor disabilities are defined as per Rehabilitation council of India Act-1992 as "a person's inability to execute distinctive activities associated with moving, both himself/herself and objects, from place to place, and such inability resulting from affliction of either bones, joints, muscles or nerves. The person with locomotor difficulties have restrictions in the activity of arms, limbs or other parts of the body on account of damage to the bones, muscles or nerves. Some common conditions giving raise to locomotor disability could be poliomyelitis, cerebral palsy, amputation, injuries of spine, head, soft tissues, fractures, muscular dystrophies etc.

Characteristics of students with Locomotor Disability

1. The Student may have difficulty to raise both the arms fully without any difficulties.
2. The Student is not able to grasp objects without any difficulty.
3. The Student may have absence of any part of the limb.
4. The Student has a difficulty in walking around the compound
5. The students may require more time for completing tasks at hand along with the rest of the class

6. The Student may require exemption to certain tasks that can be questionable in terms of safety of the students.

7. The students however may not have any difficulty in comprehending

Educational implications of students with locomotor conditions

The educational planning of students with locomotor/physical impairments are the same as their peers; but due to their disability their needs deviate from their peers in the degree and emphasis. The emphasis is placed on their intellectual development, academic ability, and facilitating total adjustment to limitations. They would require-

1. Additional needs and separate/ alternative programs

2. Facilitate to adjust with the limitations caused by the disability or enforced by the environment

3. Training in self-reliance, and ability to make choices

4. Train to plan ahead for mobility and reliance

5. Using assistive aids and orientation to usage

Cerebral Palsy

Carebral Palsy refers to a group of non-progressive conditions of a person characterized by abnormal motor control posture resulting from brain insult or injuries occurring in the pre-natal, or infant period of development.

Cerebral Palsy disorders are not caused by problems in the person's nerves or muscles. Faults in the development or damage to motor areas in the person's brain disrupt their brain's ability to control posture and movement. Cerebral Palsy is not progressive, although secondary conditions like muscle spasticity may develop that can worsen or improve over time, or may remain the same.

Characteristics of students with Cerebral Palsy

Oral motor dysfunction, such as swallowing and feeding difficulties, speech impairment, and poor facial muscle tone can also indicate Cerebral Palsy.

*   Hypotonia - decreased muscle tone or tension (flaccid, relaxed, or floppy limbs)

*   Hypertonia - increased muscle tone or tension (stiff or rigid limbs)

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- Dystonia - fluctuating muscle tone or tension (too loose at times and too tight at others)
- Mixed - the trunk of the body may be hypotonic while the arms and legs are hypertonic
- Muscle spasms - sometimes painful, involuntary muscular contraction
- Fixed joints -joints that are effectively fused together preventing proper motion
- Abnormal neck or truncal tone - decreased hypotonic or increased hypertonic, depending on age and Cerebral Palsy type
- Clonus - muscular spasms with regular contractions
  - Ankle/foot clonus - spasmodic abnormal movement of the foot
  - Wrist clonus - spasmodic movement of the hand
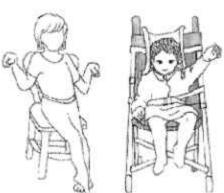
The impairment of coordination and control fall under the following types:

- Spastic movements - hypertonic movements where the muscles are too tight resulting in muscle spasms, scissoring of the legs, clonus, contracture, fixed joints, and over-flexed limbs
- Athetoid or dyskinetic movements - fluctuating muscle tone causing uncontrolled, sometimes slow, writhing movements which can worsen with stress
- Ataxic movements - poor coordination and balance making tasks - such as writing, brushing teeth, buttoning shirts, tying shoes, and putting keys into slots - difficult
- Mixed movements - a mixture of movement impairments, most commonly a combination of spastic and athetoid types, affecting different limbs
- Gait disturbances - control impairments affecting the way a child walks

Educational implications of students with locomotor conditions

The impact of cerebral palsy will vary but for most students the issues of most significance relate to physical access, manipulation of equipment, access to computers, participation in field trips, and time and energy

expended in moving around the campus. Following are the educational implications on the students:

* May need extra time to move around the venues/class

* Fatigue is common impact of cerebral palsy and may hamper learning

* Special accommodations for using facilities like toilets, food-outlets, libraries, computer labs, lecture rooms etc.

* Some students may experience functional difficulties: inability to write using a pen, reduced writing speed, involuntary head movements which affect the ability to read standard sized print, difficulty in turning pages or using computers; and reduced ability to manipulate resources in the learning environment.

* In addition to mobility impairment, they may have speech and language deficits; which may isolate them in the learning environment. The possibility of social contacts and for interaction with other students is sometimes limited and this isolation or separateness may have an impact on their learning.

* Due to associated conditions like epilepsy; many students may have frequent or unexpected absences from class owing to hospitalization or changes in their treatment procedure. Period of hospitalization may mean gaps in schooling.

* Self-reliance, ability to take initiative and the ability to make choices are areas that may need to be focused as training component.

Intellectual Impairment/Disability (Mental Retardation)

Intellectual Impairment means sub average general intellectural functioning associated with mal-adaptive behavior, occurring in the developmental period. Mental retardation is divisible into the following four categories

* Mild retardation IQ - 50 - 70.

* Moderate retardation IQ - 35 - 49.

* Severe retardation IQ - 20 - 34.

* Profound retardation IQ under 20.

Educational classification of Intellectual disability

Pre-primary: This is an early pre-schooling group for children between 3-6 years of age.

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Primary-I: This group consists of children between 7-10 years of age. Students achieving 80% of the items in pre-primary are promoted to Primary-I.

Primary-II: This group consists of children between 9-14 years of age. The students who do not achieve 80% of the items in pre-primary level even after 4 years of age are placed in primary-II.

Secondary Group: This group consists of children between 11-14 years of age. Students achieving 80% of the items in primary-I & II are promoted to Secondary group.

Prevocational-I: This group consists of children between 15-18 years of age. Students achieving 80% of the items in Secondary are promoted to Prevocational-I group.

Prevocational-II: This group consists of children between 15-18 years of age. The students who do not achieve 80% of the items in Secondary level even after 4 years of age are placed in prevocational-II.

Characteristics of students with intellectual disabilities

1. May have trouble speaking legibly
2. May have difficulty in remembering or recalling concepts through ones memory
3. May not understand how things work
4. May have trouble in age appropriate social behavior or adhere to social norms
5. May have difficulty in understanding the consequences of actions
6. May have difficulty in problem solving
7. May have difficulty in logical thinking

Educational implications of students with intellectual disabilities

The students may

1. May be restricted to understanding concrete concepts
2. would be unable to perform application based exercises
3. May would require one on one remedial training for academic work
4. require alternatives in subjects for secondary grades
5. May be unable to adhere to the examination time and norms as per the grade

Autism Spectrum Disorder (ASD)

Autism is a developmental disorder that appears in the first 3 years of life, and affects the normal development of brain and impairs social and communication skills.

Characteristics of students with Autism Spectrum Disorder

1. little or no eye contact.
2. Resistance to being held or touched.
3. May get too close when speaking to someone (lack of personal space).
4. Responds to social interactions, but does not initiate them.
5. Does not generally share observations or experiences with others.
6. Difficulty understanding jokes, figures of speech or sarcasm.
7. Difficulty reading facial expressions and body language.
8. Difficulty understanding the rules of conversation.
9. Difficulty understanding group interactions.
10. Aversion to answering questions about themselves.
11. Gives spontaneous comments which seem to have no connection to the current conversation.
12. States inappropriate observations.
13. Seems unable to understand another's feelings.
14. Prefers to be alone, aloof or overly-friendly.
15. Difficulty maintaining friendships.
16. Finds it easier to socialize with people that are older or younger, rather than peers of their own age.
17. Unaware of/disinterested in what is going on around them.
18. Talks excessively about one or two topics (dinosaurs, movies, etc.).
19. Overly trusting or unable to read the motives behinds peoples' actions.

Educational implications of students with Autism Spectrum Disorder

1. Minimal acknowledgement of others.
2. Exceptionally high skills in some areas and very low in others.
3. Excellent rote memory in some areas.
4. Difficulty with reading comprehension (can quote an answer, but unable to predict, summarize or find symbolism).

5. Difficulty with fine motor activities (colouring, printing, scissors, gluing).

6. Short attention span for most lessons.

7. Resistance or inability to follow directions.

8. Difficulty transitioning from one activity to another in school.

Learning Disabilities

Learning Disabilities refer to a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information. These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning. As such, learning disabilities are distinct from global intellectual deficiency. The condition gives rise to difficulties in acquiring knowledge and skills to the normal level expected of those of the same age.

Learning disabilities result from impairments in one or more processes related to perceiving, thinking, remembering or learning. These include, but are not limited to: language processing; phonological processing; visual spatial processing; processing speed; memory and attention; and executive functions (e.g. planning and decision-making).

Learning disabilities range in severity and may interfere with the acquisition and use of one or more of the following:

*   oral language (e.g. listening, speaking, understanding)

*   reading (e.g. decoding, phonetic knowledge, word recognition, comprehension)

*   written language (e.g. spelling and written expression) and

*   mathematics (e.g. computation, problem solving).

Characteristics of children with Learning Disabilities -

1. Short attention span, Poor memory,

2. Difficulty following directions,

3. Inability to discriminate, between/among letters, numerals, or sounds,

4. Poor reading and/or writing ability,

5. Eye-hand coordination problems;

6. Difficulties with sequencing ,

7. Disorganization

8. Other sensory difficulties

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Educational implications of students with Learning disabilities

1. Detailed scheduling and orient the child of the expectation
2. Instruction to be given that are short and precise for each activity
3. Adequate time to complete tasks
4. The students should be given opportunity to understand the exam paper
5. Alternative tests to be given with more time to attempt the paper
6. Scribe is not necessarily the only alternative- oral recording / oral tests/ one word answering or shorter examination are easier alternatives

Hearing Impairment (HI)

Hearing loss, also known as hearing impairment, is a partial or total inability to hear. A deaf person has little to no hearing. Hearing loss may occur in one or both ears. Hearing loss can be categorized as mild, moderate, moderate-severe, severe, or profound.

Characteristics of students with Hearing Impairment

- has problems paying attention in the school.
- finds it difficult to understand speech if presented behind him.
- answers questions irrelevantly.
- requires repetitions of speech for following instruction.
- displays poor vocabulary and grammar, voice problems and mispronunciation.
- does not mix easily with other children of his age.
- uses too many gestures.

Educational implications of students of Hearing impairment

Variations in causes, onset, degree, and type of hearing loss, as well as family and educational situations, result in a widely diverse hearing impaired population. Following are some commonly observed implications:

- Since social-emotional development relies so heavily on communication, the student with a HI may not participate in cooperative play or learning activities.
- Without a common communication system, the ability to develop friendships is negatively impacted.
- Difficulties in performance appear due to limitations with speaking, reading, and writing the English language, however, it does not impact the level of intelligence.

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- Speech and language skills are the areas of development most severely affected for those with a HI, particularly for children who are born deaf.

- Children with more profound hearing impairments and deafness are unable to access auditory feedback, impairing the normal development of speech and language.

- Delayed educational achievement in comparison to that of their hearing peers.

Visual Impairment

A sensory impairment like total blindness or low vision is bound have many effects on cognition , affective development and physical development impacting day to day life. These effects are either the direct (intrinsic) or indirect (extrinsic) results produced by the visual impairment as such or the indirect (extrinsic) results stemming from the reactions of the social environment to the impairment. Both these factor affect the visually impaired child in various ways and degrees during his development.

Every teacher who deals with a visually impaired child must be aware of certain characteristics of or related to the child's visual impairment.

Legal blindness refers to a condition when a person suffers from any of the following conditions namely:

- Total absence of sight

- Visual acuity not extending 6/60 or 20/200 (Snellen) in the better eye after best possible connection ; or

- Limitation of the field of vision subtending an angle of 20 degree or worse.

Person with low vision means a person with impairment of visual functioning even after treatment or standard refractive connection but who uses or is potentially capable of using vision for the planning or execution of task with appropriate assistive devices.

Snellen chart is used to measure visual acuity (keenness of vision). It contains letters of alphabet in varying sizes and is used to eye specialists

Characteristics of students with visual impairment

Problems with vision require an early identification intervention to ensure optimal development of potentials and an overall development of personality. These behavioural manifestations are indicators of partial or complete visual impairment.

- Frequent watering of eyes
  - Frequent rubbing of eyes
  - Frequent red, encrusted or inflamed eyes
  - Jumpy and unsynchronised eye movements (Nystagmus)
  - Frequent complaints of headache or eye infections
  - Difficulties in coordinating both eyes (tendency to use one eye more in comparison to the other)
  - Clumsy movements
  - Need to exert and change position; e.g.: blinking of eyes, tilting of head, closing one eye or squinting to focus better
  - Difficulty in reading from blackboard (even if sitting in the front row)
  - Keeping books too close / too far while reading
  - Repetitive stereotypic movements like rocking, eye poking, bead rolling
  - Complains of dizziness of fatigue after task requiring prolonged visual attention
  - Difficulty in moving around, bumping into things doors etc.
  - Difficulty in reading small print or identifying small details in pictures or illustrations
  - Poor eye hand coordination
  - Loses his lines while reading

Educational implications of students with visual impairment

- Blindness is a condition that relates to impaired sense of eight. As senses are the gateway of knowledge, the sensory deficit reduces the range of variety of experiences significantly. 80% information about the environment as gained through seeing and in the absence of the sense of seeing this 80% information has to be translated (to other means) to compensate for the loss. According to lowenfeld (1975), blindness imposes three basic limitations on the individuals. Firstly it restricts range and variety of experiences. Secondly it restricts the ability to move about and finally it limits the control of the environment of self in relation to it.

- So the curriculum should be planned to provide compatible of relevant educational experiences, increasing their mobility and providing adequate exposure to the environment. Realization of these curricular objectives would yield better concept development of V.I.C.

4. Classroom Management Strategies in Different Subjects for Inclusive Classroom at Secondary Level

A classroom is a vibrant place where children with diverse likes, interest, abilities, intelligence, beliefs, attitudes nurture and bloom under the guidance of a teacher. To manage a diverse group like classroom, teacher needs to plan meticulously so that each and every child learns, participates and performs to the best of his/her ability and the classroom becomes inclusive in the true spirit of the term.

Before we begin, it is imperative to develop an understanding regarding Inclusive Education. UNESCO International Conference on Education, held in Geneva in November 2008, acknowledged that, *'Inclusive Education is an ongoing process aimed at offering quality education for all while respecting diversity, different needs, abilities, characteristics and learning expectations of the students and communities eliminating all forms of discrimination'* (UNESCO, 2009, p.126). Thus, Inclusive class is a regular class with Children with Special Needs (CWSN) as an added variant to the already existing heterogeneity.

The classroom management strategies for an inclusive class at secondary stage are not much different from the traditional teaching strategies. Teacher's working with diverse learner in an inclusive class must believe that all students have potential to learn while respecting and accepting the unique characteristics and perceptions of individual learners. Effective teaching for CWSN does not require unique set of skills. It is a combination of good teaching practices and sensitivity towards all students. The pre-requisite for learning in an inclusive classroom is that the cwsn should have full participation in the day-to-day life of the classroom. To include students with disabilities in the day-to-day life of the classroom, Ferguson and Bogdon (1987) give the following guidelines:

1. Do not segregate the students with special needs into separate groups. Mix these students in the groups of students who do not have special needs.

2. It should be made sure that the language and behaviour of the teacher towards students with special needs is a good model for everyone.

3. Teacher should try to keep similar schedules and activity patterns for all students.

4. Students should work together in cooperative groups on special projects such as role plays, planning, helping, demonstrating, performing etc.

5. Instead of sending students with disabilities out for special services such as – speech therapy, remedial reading or individualized instruction, the teacher should try to integrate the special help into the class setting, during a time when the other students are working independently in the same setting.

6. Students should be made familiar with aids such as hearing aids, sign language, and communication boards, and so on, which are used by individuals/students with disabilities.

7. Students with disabilities should be given many opportunities to exhibit their abilities. For example- writing, talking, drawing, organizing, planning, demonstrating, helping or performing etc.

The table below lists classroom management strategies derived using the principals mentioned above. The strategies are pragmatic and developed keeping in mind the teaching learning needs at the secondary and senior secondary level. For the sake of brevity, the term secondary wherever used in the paragraphs below is inclusive of secondary and senior secondary

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stage of school. An attempt has been made to arrange strategies as per the subjects/disciplines in the secondary schools, starting with the general strategies for making the secondary classroom an inclusive classroom.

Table I: Generic Classroom Management strategies for Inclusive Class: [Secondary Level]

No.	Students & categories of Impairment	Classroom requirement according to Impairment
1.	Sensory Impairments a. Visual Impairment	• Spatial Knowledge of the surroundings • Pre-awareness/familiarity with environment for easy movement • Sitting arrangement: proximity to the board for low vision • Extra inputs for enhancement of communication Skill for better group interaction (knowing what to say/when to say, knowing whom to refer as what) • Appropriate distance from teacher to hear the voice clearly • Minimizing audio clutter in the classroom
	b. Hearing Impairment	• Extra support and help for language development & Communication skills(voice clarity/ voice modulation/ stuttering / conveying of thoughts appropriately) • Well lit room • Sitting arrangement: proximity to board for visual clarity • Appropriate distance from teacher for lip reading
2.	Intellectual Impairment a. Mental Retardation	• Lot of extra drill and practice • Extra support and help for language development & Communication skills (voice clarity/ voice modulation/ stuttering / conveying thoughts appropriately) • Clear sign boards in school for direction • Use of flash cards/ visual cues maximized • Organized information in small chunks • Delivery should be strictly focused and activity based • Enough scope for drill and practice

	b. Learning Disability	• Extra support and help for communication Skill for better group interaction (knowing what to say/when to say, knowing whom to refer as what)
		• Clear sign boards in school for direction
		• Reviewing directions of a lesson or assignment with the students in advance
		• While interacting with the child undivided attention should be paid and whatever child says should be listened carefully.
		• Use of flash cards/ visual cues maximized
		• Organized information in small chunks
		• Delivery should be strictly focused and activity based
	c. Autism	• Assistance for moving around in school/ use toilet
		• Clear sign boards in school for direction (if possible signages to be supported with visuals)
		• Extra support for enhancing communication Skill for better group interaction (knowing what to say/when to say, knowing whom to refer as what)
		• Visual clues or reminders for participation and appropriate response in classroom
		• Maximize use of flash cards/ visual cues
		• Organized information in small chunks
		• Delivery should be strictly focused and activity based
3.	Physical Impairment a. orthopedic Impairment	• Free space in class for the movement in case the child is using braces, crutches or wheelchair
		• Provide help for moving around in class or reaching for things, incase required
		• Provision of physiotherapy or short leave for therapy sessions

b. Cerebral Palsy	• Support for improvement in language development & Communication skills(voice clarity/ voice modulation/ stuttering / conveying of thoughts appropriately) • Provide assistance to move around in school/ use toilet • Free space in class for the movement in case the child uses braces crutches or wheelchair • Provide help for moving around in class or reaching things • Provision of assistive devices for writing and speaking • Provision of physiotherapy or short leave for therapy sessions

Language

Effective use and understanding of languages(s) enables the child to make connections between ideas, people and things, and to relate to the world around. It is important to recognise the inbuilt linguistic potential of children as well as to remember that languages get socio-culturally constructed and change in accordance with our day-to-day interactions. Education should help to build the language and communication skills so that the participation in group activities and self-expression can be ensured. Children with speech impairments, hearing impairments and other conditions affecting speech and communication should be introduced to standard sign language, so that their participation and inclusion can be optimized. Recognition of the linguistic abilities of learners would encourage them to believe in themselves and their cultural moorings (NCF, 2005). It has often observed that cwsn who do not use verbal languages develop need and context based sign and symbol systems for expression and communication. While many cwsn may pick up basic language skills through social interactions, they could additionally be provided with especially designed materials that would assist and enhance their growth and development. Studying sign language and Braille could be included as options alternative to language learning (English, French, Hindi etc.) for learners without disabilities. This will not only ensure sustained peer support but may also prove beneficial for non-CWSN later in life, as career or vaction. Multilingualism, which is constitutive of the identity of a child and a typical feature of the Indian linguistic landscape, must be used as a resource, classroom strategy and a goal by language teachers. This is not only the best use of a resource readily available, but also a way of ensuring that every child feels secure and accepted, and that no one is left behind on account of his/her linguistic background, language ability or disability.

Table II: Classroom Management strategies for Inclusive Class: Language [Secondary Level]

S. No.	Students & categories of Impairment	Classroom Management Strategies
1.	Sensory Impairments c. Visual Impairment	• Provide large print books to children with low vision & provide books in Braille to children who are legally blind • Promote use of other senses for understanding may be via Tactile Aids, audio aids etc. • During oral presentations or communications it is advisable to modulate the voice
	d. Hearing Impairment	• During oral communication or expression or narration it is advisable to use facial expressions/ hand movements / sign language • Teacher should speak slowly and clearly allowing students to lip read • Support oral/verbal expression with visual symbols/clues (play cards/ using ICT) • Provide motivation for independent reading/writing
2.	Intellectual Impairment d. Mental Retardation	• Divide the concepts into smaller chunks • Teach with lots of scope of drill and practice • Focus on the functional aspects of the concepts in language • If possible avoid the abstract concepts, depending on the need and capabilities of the child
		• Teacher should be observant of behavioral responses by the learner (nodding/ eye contact / other expressions) to understand whether learner's attention is on the class room activities or process or not • Provide motivation for independent reading/writing • Provide ability appropriate reading writing material

	e. Learning Disability	• Divide the concepts into smaller chunks • Teach with lots of scope of drill and practice • Focus on the functional aspects of the concepts in language • Teacher should be observant of behavioral responses by the learner (nodding/ eye contact / other expressions) to understand whether learner's attention is on the class room activities or process or not • Provide motivation for independent reading/writing • Provide ability appropriate reading writing material
	f. Autism	• Language learning is to be supported with lots of visual clues • Try to establish routines and fixed schedules • Avoid last minutes changes in the assessment or teaching learning activities • pre-familiarization of the child with the teaching learning activities to be followed in the classroom • use social stories to pass on the message regarding any last minute change in the teaching learning strategies
3.	Physical Impairment c. Orthopedic Impairment	• No specific requirement • Provide enough motivation for learning language • Appreciate the efforts of the child • The child may need help in turning the pages or writing or taking notes etc. please provide need and situation based support
	d. Cerebral Palsy	• No specific requirement • Provide enough motivation for learning language • Appreciate the efforts of the child • The child may need help in turning the pages or writing or taking notes etc. please provide need and situation based support • Make allowance for speech therapy if child requires • Collaborate with the child's speech therapist

Science

Science is observing and learning the laws of nature. For convenience it's divided into physical, chemical or biological sciences. Multisensory science experiences enhance not only logical thinking and skills of the cwsn but also boost their communication ability and self-esteem. The apparatus in the science laboratory should be adapted or modified as per the specific needs (tactual, auditory, visual etc.) of the students.

Example I: talking calculator, talking clock and talking thermometer will benefit all students including students with sensory deficits. Projectors can be used for students with visual impairments. Adapted equipments and materials can be purchased or made. Instruments that normally have visual output can be modified to have audio output.

Example II: Three dimensional raised leaf plastic charts, rigid printed PVC sheet and models on Human Physiology and Human body system like human skeleton, circulatory system, nervous system, a section of brain, muscles, digestive system, the ear, the nose and the eye etc., are easily available which can be used in inclusive science classroom for all students including students with special needs.

Example III: In biology class, while teaching 'digestive system', if teacher is planning that all children will draw the diagram of human digestive system and explain the process of digestion then, for a child with visual impairment, the modified teaching goal could be - the child will explain the digestion process verbally with the help of given model or embossed diagram of digestive system. Similarly, individual goal for a child with hearing impairment attending the same class may be to draw the diagram of human digestive system, explain the process in written form (if she/he cannot communicate verbally), whereas a child with intellectual disability will tell the function/name of at least 5-parts of the digestive system, when indicated on the model or diagram of digestive system.

Example IV: In science laboratory, "lab buddy" is usually paired with the student with special needs, who understands the student's limitations, and can work within that framework to do the lab activities "with" the student with special needs rather than "for" him or her. For example, for a student with cerebral palsy, microscope and the materials to be observed may be placed by a 'lab buddy' and the student herself may do focal adjustment with physical assistance to view the particular object.

Given below are the some strategies that may be beneficial for teachers teaching science in inclusive classroom. The suggestions are not divided into physics, chemistry or biology as the nature of modifications for teaching the three branches of science remains more or less the same.

Table III: Classroom Management strategies for Inclusive Class: Science [Secondary Level]

S. No.	Students & categories of Impairment	Classroom Management Strategies
1.	Sensory Impairments e. Visual Impairment	• Maximize the use of tactile / multisensory aids • Use multimedia as and when needed • Activity cards in big font size for children with low vision • Performing experiments with the help of peer buddy • Relating scientific concepts to daily life • Educational Excursions relevant to the topics under study • Audio notes that is recoding of main points in audio format • Provision of audio taping the lectures and classroom discussions • Demonstrations to be converted in individual activities if possible • Writings on the blackboards to be verbalized or if possible please provide Braille handouts/audio notes for the derivations in physics, equations in chemistry and descriptions of species in biology Laboratory • Hands on experience • Making children with VI familiar with the apparatus and laboratory space and its layout • Peer buddy during lab work • Provide required quantity of chemicals in bottles/containers that can be identified using touch • try using other senses (smell, temperature difference, texture, pressure, sound etc.) for observations • avoid over dependence on sense of sight say for example during experiment on acid base identification, try finding a test indicator which works on sense of smell (olfactory)
	f. Hearing Impairment	• Focus on building the subject appropriate vocabulary words/ terminology • Teaching using sign language supported by written clues/ visuals/ flashcards • Speak slow for lip reading

		• Use of multimedia
		• Step by step instruction using flash cards with visuals for laboratory work
		• Peer buddy during lab
		• Lab equipments with sound signals can be wired to include a light or other visible signal
		• Relating scientific concepts to daily life
		• Using visual teaching aids
		• Educational Excursions relevant to the topics under study
		• Keeping the expectations at par with other Non-disabled students
		• Avoid over reliance on auditory observations
2.	<u>Intellectual Impairment</u> g. Mental Retardation	• Teaching slowly and reinforcing at short intervals • Use of teaching aids for better understanding of concepts • Use of multimedia and ICT • Teaching children handling apparatus and performing experiments with the help of peer buddy
		• Relating scientific concepts to daily life for simple understanding • Educational Excursions relevant to the topics under study • Focus on the functional aspect of the science • Use of assistive devices may be equated with learning of science • Avoid abstract learning
	h. Learning Disability	• Teaching slowly and reinforcing at short intervals • Use of teaching aids for better understanding of concepts • Use of multimedia approach • Relating scientific concepts to daily life for facilitating understanding • Use variety of teaching learning approaches to draw/ sustain attention of child for longer duration • Educational Excursions relevant to the topics under study • Provide summary/brief of the lesson • Pre-familiarization with the topic to be learnt

	i. Autism	• Provide appropriate reinforcement regularly • Use of multisensory teaching understanding of concepts • Use of multimedia approach • Relating scientific concepts with facilitating understanding • No need to avoid abstract concepts • While teaching draw attention of the child by calling his/her name, often children with autism need to be reminded for participation and desired behavior in the class
		• Be sensitive to the child's need for time alone • Often children with autism may be extra sensitive to some environment stimuli (colour of a chemical, touch of an apparatus, smell or sound etc.) make concessions for unpleasant stimuli
3.	Physical Impairment e. Orthopaedic Impairment	• if required modify the apparatus for better grip and ease of handling • modifications required as per the need and situation of the child
	f. Cerebral Palsy	• Teaching slowly and reinforcing at short intervals • Use of teaching aids for better understanding of concepts • Use of multimedia and ICT • Modifying apparatus for better grip and control • Consult parents for identifying the modifications required

Mathematics

"Mathematics is the science and language of pattern, just like biology is a science of living organisms and physics is a science of matter and energy. Learning mathematics is to investigate and express relationships among patterns, to describe patterns in complex and obscure contexts; to understand and transform relations among patterns ; to classify, encode and describe patterns, to read and write in the language of patterns for various practical purposes" (Mathematical Science Educational Board, 1990, P.5).

Many general tactics of problem solving can be taught progressively during the different stages of school; abstraction, quantification, analogy, case analysis, reduction to simpler situations, even guess-and-verify exercises etc. are useful in many problem-solving contexts. (NCF, 2005) Teaching mathematics to CWSN is both a challenging and stimulating endeavour. Teaching mathematics requires thinking about concept maps, learner centred pedagogy and diversified creative assessment. The National Council of Teachers of Mathematics (NCTM, 1991) professional teaching standard defines the role of mathematics teachers as:

- Teach concepts, procedures and convictions.

- Promote mathematical problem solving, reasoning and convictions.

- Foster students' mathematical dispositions.

- Assess students' understanding of mathematics.

- Create a learning environment that promotes the development of each child's mathematical power

At secondary level Mathematics comprises of different thematic arrangements such as algebra, geometry and probability, but all these strands are very well interconnected. These interconnections must be not only identified but should also be used effectively through resourceful teaching. A coherent curriculum helps to construct and integrate important mathematical ideas to build more refined conceptual structures. Children also need exposure to the use of heuristics, or rules of thumb, rather than only believing that Mathematics is an 'exact science'(NCF, 2005). Individual and group exploration of connections and patterns, visualisation and generalisation, and making and proving conjectures are important at this stage. At this stage, students integrate the many concepts and skills that they have learnt into a problem-solving ability. Mathematical modelling, data analysis and interpretation taught at this stage can result in a high level of mathematical literacy.
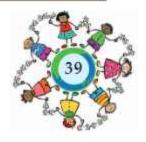
Given below are some suggestions or strategies for teachers teaching mathematics at secondary level. By following the suggestions and strategies the CWSN sitting in the regular classroom can effectively participate in the teaching learning process of the classroom there by making classroom, truly inclusive.

Table IV: Classroom Management strategies for Inclusive Class:
Maths [Secondary Level]

S. No.	Students & categories of Impairment	Classroom Management Strategies
1.	Sensory Impairments g. Visual Impairment	• Use of abacus and embossed geometry set • Peer tutoring • Teacher reinforces the concept orally • Encouraging the child to participate
		• Not to lower expectations • Using talking calculator • Providing assignments in Braille or Audio format • Depending on the comfort level of the child, modifying the curricular content related to geometry
	h. Hearing Impairment	• Solving porblems on black board and reinforcing the formula/concept used by speaking slowly to be lip read • Peer buddy during use of geometry while drawing on black board. • Encouraging the child to participate • Not to lower expectations • Support verbal instructions with visual clues/ flash cards/ written instructions • Ensure child's attention in the classroom • Sustain motivation to learn • Appreciate efforts of the child towards learning
2.	Intellectual Impairment j. Mental Retardation	• Teaching the concept slowly • Giving one question at a time and breaking the concept into small steps • Use of aids (blackboard/audio-visual aids) wherever possible • Encouraging the child to participate • Focus on the functional aspect of mathematics learning • Relate mathematics teaching learning with day to day use of mathematics • Avoid or replace abstract concepts

	k. Learning Disability	• Teaching the concept at slow pace • Giving one question at a time and breaking the concept into small steps • Use of aids (blackboard/ audio-visual aids) wherever possible • Encouraging the child to participate • Provide lots of drill and practice • Do not lower expectations, unless child is identified as having dyscalculia. For children with dyscalculia learning of mathematics is extremely stressful so depending on situation and specific need of the child try to modify or adapt the curriculum
	1. Autism	• Support teaching with visual clues • Use of aids (blackboard/ audio-visual aids) wherever possible • Allowing the child to respond in comfortable manner either orally or pictorially or by writing • Encouraging the child to participate • Not to lower expectations
3.	Physical Impairment g. Orthopedic Impairment	Modifications required will depend on the specific learning need and condition of the child. Usually children with orthopaedic impairments can participate easily in all the classroom activities
	h. Cerebral Palsy	• The child may require support to grip the pen/pencil/ geometrical apparatus • Provide page turner or paste stickers or small piece of foam or other material at the corner of pages for ease of turning the pages • Use of aids (blackboard/ audio-visual aids) wherever possible • Allowing the child to respond in comfortable manner either orally or pictorially or by writing • Encouraging the child to participate • Not to lower expectations

Social Science

At the secondary stage, the social sciences help students in understanding the environment in its totality and also in developing a broader perspective and an empirical, reasonable and humane outlook. It encompasses five disciplines namely history, geography, political science, economics and sociology. Although these subjects may vary, they seek to explore individual and collective human behaviour and how such behaviour influence or, are influenced by families, communities, cultures, institutions, environment, and societies; and by ideas, norms, and values. The primary aim of social sciences is to not only deepen understanding of fundamental concepts but also enable learners to develop a critical understanding of how human beings and communities function from the local to the global. By providing a critical lens social sciences enables students to build their awareness of a wide variety of issues such as war and peace, democracy and autocracy, power and governance, poverty, race and class, gender and patriarchy, stereotypes and prejudice, and many more. It also empowers students to make decisions in an increasingly complex and diverse society. Teaching learning of Social science at the secondary stage is important for promoting critical thinking amongst students and encourage discussion on issues that are linked to their lived realities. Social Science teachers must be sensitive to the learning needs of all categories of students. For instance, visuals and maps may not be of much use for visually challenged students or for those with low vision. This does not mean that they be denied the opportunity to understand visuals and their relevance. Rather it provides an opportunity for teachers to explore the scope of utilizing tactile teaching-learning aids and activities. Further teachers can make an attempt to explain and describe visuals in verbal format and then initiate a discussion in class about the theme or topic of the visual. Resource material in the form of audio books and other need-based material such as tactile, Braille, etc. may be utilized in order to enhance learning and meaningful participation of students. Children with visual challenges can easily assimilate 80% of teaching that takes place in the classroom, if they are provided with the correct supportive material in the correct form at the correct time (M.N.G. Mani, 1998). We are all aware that many students may not have access to visual mediums such as television or access to computers. Use of the radio including community radio as an effective medium to understand and critically analyse socio-political issues can also enrich learning in the classroom. Events and issues related to development, democracy, environment, water, sustainable development, people's movements, etc. are often discussed on radio but we rarely use the radio for such purposes. The potential of this medium can be judiciously used for the benefit all students including C WSN to enhance their understanding of contemporary issues.

Table V: Classroom Management strategies for Inclusive Class: Social Science [Secondary Level]

S. No.	Students & categories of Impairment	Classroom requirement according to Impairment
1.	Sensory Impairments i. Visual Impairment	• Pre familiarization with the concept • Use of tactile maps / globe • Use of multimedia and ICT/audio books
		• access to internet and other resource material in the form of newspapers, radio, journals and audiovisual as teaching aid to develop better socio political understanding • Use of tactile aids • Educational Excursions relevant to the topics under study • Using Debate and Discussion as part of teaching; forming pair with sighted peer buddy & ensuring cwsn participation
	j. Hearing Impairment	• Use of visual aids/multi media • access to internet and other resource material in the form of newspapers, radio, journals and audiovisual as teaching aid to develop better socio political understanding • Using Debate and Discussion as part of teaching; forming pair with peer buddy & ensuring cwsn participation • Educational Excursions relevant to the topics under study • Provide written brief of the audio's and film clippings used in teaching learning
2.	Intellectual Impairment m. Mental Retardation	• Breaking the complex concepts into small sequential parts • Reinforcing the topic • Use of multisensory approach • Access to internet and other resource material in the form of newspapers, radio, journals and audiovisual as teaching aid to develop better socio political understanding • Using Debate and Discussion as part of teaching; forming pair with peer buddy & ensuring cwsn participation • Educational Excursions relevant to the topics under study • Focus on the functional part of social science curriculum say for example democracy, human rights, discrimination, constitutional rights, racism etc.

	n. Learning Disability	• Breaking the complex concepts into small sequential parts • Reinforcing the topic • Additional practice • Use of multisensory approach/ICT • Access to internet and other resource material in the form of newspapers, radio, journals and audiovisual as teaching aid to develop better socio political understanding
		• Using Debate and Discussion as part of teaching; forming pair with peer buddy & ensuring cwsn participation • Educational Excursions relevant to the topics under study • Often children with dyslexia and dysgraphia find learning social science a stressing experience. Please be considerate towards their difficulties and trust that the child is not escaping learning of social science • Avoid essay type answers from children with dyslexia or dysgraphia
	o. Autism	• Breaking the complex concepts into small sequential parts • Reinforcing the topic • Use of multisensory approach/ICT • access to internet and other resource material in the form of newspapers, radio, journals and audiovisual as teaching aid to develop better socio political understanding • Using Debate and Discussion as part of teaching; forming pair with peer buddy & ensuring cwsn participation • Educational Excursions relevant to the topics under study • Providing lots of visual clues • Help the children to identify pattern and sequence of events • Draw the attention of the child to minute details
3.	Physical Impairment i. Orthopedic Impairment	• Educational Excursions relevant to the topics under study • access to internet and other resource material in the form of newspapers, radio, journals and audiovisual as teaching aid to develop better socio political understanding • Using Debate and Discussion as part of teaching

j. Cerebral Palsy	• Breaking the complex concepts into small sequential parts
	• Reinforcing the topic
	• Use of multisensory approach/ICT
	• access to internet and other resource material in the form of newspapers, radio, journals and audiovisual as teaching aid to develop better socio political understanding
	• Using Debate and Discussion as part of teaching; forming pair with peer buddy & ensuring cwsn participation
	• Educational Excursions relevant to the topics under study

Conclusion

Teaching learning in an inclusive classroom is not difficult and not much different from the teaching practices or strategies adopted by teachers in the classroom. An honest, sincere, dedicated and sustained effort towards involving and facilitating participation of all children in the teaching learning activities of the classroom is the only requirement to convert a regular traditional classroom into an inclusive classroom. An inclusive classroom usually has lots of group activities, hands on experience activities, children helping each other, teacher acting as mentor or facilitator of learning. The task may appear to be difficult at first glance but practice and sustain effort can make teaching in inclusive classroom a satisfying experience.

5. Guidelines for Curriculum Adaptation at Secondary Level

For Neuro-Developmental & Locomotor Disabilities

The developmental needs of learners should not prevent them from progressing with their age. Learning, teaching and assessment/evaluation strategies must be differentiated or adapted to meet the individual needs of all learners. Adequate and timely planning and modification of existing phased long learning programs, year-long work schedules and lesson plans can ensure that all learners learn effectively and achieve their full potential.

There is no specific recipe for adapting general education curriculum to meet each student's needs. Each teacher, each student, each classroom is unique and adaptations are specific to each situation.

We must keep in mind that curriculum does not always need to be modified. By providing multilevel instruction you will find that adapting a lesson may not always be necessary. Differentiating instruction and providing multiple ways to assess allows more flexibility for students to meet the standards and requirements of the class. At other times, the curriculum can be made more accessible through accommodations. In addition, supports for one student may not necessarily be the same in all situations, e.g., a student who needs full time support from a paraprofessional for math may only need natural supports from peers for English, and no support for art. And, supports should not be determined by the disability label, instead

supports should be used when the instructional or social activity warrants the need for assistance. (Fisher and Frey, 2001).

Adaptations made to existing curriculum, work schedules and lesson plans as well as newly designed curriculum, work schedules and lesson plans that provide life- skills training and programme-to-work linkages to meet the needs of learners; must by no means compromise the standard of the curriculum. In this chapter we make an attempt to provide guidelines that will assist with differentiation, modification, adaptation, planning and management of the curriculum to address diversity. However, while conceptualizing the framework for adaptation of the curriculum, a wide range of factors that have direct impact on the learner, the school and its resources, the parents and the community must be considered.

We must remember, that any Inclusive Learning, Teaching and Assessment Strategies, must always address the Visual, Communication, Physical, Cognitive, Social, Environmental and Auditory barriers faced by the learner. And to address these diverse needs of the learners, we must understand the curriculum in its entirety; that is:

- The content (i.e. what is taught).
- The language or medium of instruction.
- How the classroom is organized and managed.
- The methods and processes in teaching.
- The pace of teaching and the time available to complete the curriculum.
- The learning materials and equipment that is used.
- How learning is assessed/evaluated.
- Eligibility for promotion to next level.

The forms and examples on the following pages provide information about curriculum and types of adaptations that could be considered in developing the appropriate strategy for a particular student. Examples are provided for both elementary and secondary levels.

Curricular Adaptation & Decision Making Process

Following decision making flowchart can be used to conceptualize the process of selecting and implementing curricular adaptations. It should be used as a tool for a team in determining an individual student's needs:
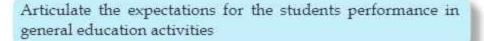
If the above adaptation strategies are not effective, we may need to design an alternative activity and evaluate the effectiveness of adaptations.

Considerations before Curricular Adaptation:

1. **Examine the Structure of the Instruction**
   - Can the student actively participate in the lesson without modification? Will the same essential outcome be achieved?
   - Can the student's participation be increased by changing the instructional arrangement? From traditional arrangements to:
     - Cooperative groups
     - Small groups
     - Peer partners
     - Peer or cross-age tutors

Identify the student's individual educational goals and objectives to be emphasised during general education activities

↓

Articulate the expectations for the students performance in general education activities

↓

What to Teach: As a team, determine the content of the general education activity, theme or unit study

↓

How to Teach: As a team, determine if, without modification, the student can actively participate and achieve the same essential outcomes as mainstream classmates. If the student cannot achieve the same outcomes...

↓

Select the design of appropriate adaptations:

Lesson Format, Specific Teaching Strategies, Curricular Goals Physical & Social Environment, Modification of Material, Support and Supervision arrangements, Evaluation etc.

- Can the student's participation be increased by changing the lesson format?
    - Interdisciplinary/thematic units
    - Activity-based lessons, games, simulations, role-plays
    - Group investigation or discovery learning
    - Experiential lessons
    - Community-referenced lessons
- Can the Student's participation and understanding be increased by changing the delivery of instruction or teaching style?

2. **Examine the Demands and Evaluation Criteria of the Task**
    - Will the student need adapted curricular goals?
        - Adjust performance standards
        - Adjust pacing
        - Same content but less complex
        - Similar content with functional/direct applications
        - Adjust the evaluation criteria or system (grading)
        - Adjust management techniques

3. **Examine the Learning Environment**
    - Can the changes he made in the classroom environment or lesson location that will facilitate participation?
        - Environmental/physical arrangements
        - Social rules
        - Lesson location

4. **Examine the Materials for Learning**
    - Will different materials be needed to ensure participation?
        - Same content but variation in size, number, format
        - Additional or different materials/devices
        - Materials that allow a different mode of input
        - Materials that allow a different mode of output
        - Materials that reduce the level of abstraction of information

5. **Examine the Support Structure**

   - Will personal assistance be needed to ensure participation?
     - From peers or the general education instructor?
     - From the support facilitator'?
     - From therapists'?
     - From paraprofessionals?
     - From others?

6. **Arrange Alternative Activities that foster Participation and Interaction**

   - Will a different activity need to be designed and offered for the student and a small group of peers?
     - In the classroom
     - In other general education environments
     - In community-based environments

It is important to correlate adaptations with 1EP (Individualized Educational Program) specifically for individuals with neurodevelopmental disabilities like Intellectual Impairment, Autism Spectrum Disorder or Cerebral Palsy. Here, we adapt to meet the students need as identified on an IEP. Following are some more considerations, which may help us in selecting appropriate adaptations for students with special needs:

A) Curriculum as is.	• This is what we forget most frequently. • We must look at the general education curriculum and consider if the students on IEPs may gain benefit from it as it is. • We must remember that incidental learning does occur.
B) Different objective within the same activity and curriculum. (Partial Participation)	Here, the student with special needs participates in same activity with all other students, when possible; but may have a different learning objective.

C) Material or environmental adaptations.	Here, material or environmental changes are utilized to enhance participation of student with special needs in the general education curriculum. For example: • Giving picture instructions rather than written directions. • Allowing use of computer to write instead of paper and pencil. • Reading a test to a student. — Highlighting the important concepts in a textbook. — Taped textbook or enlarged print material. — Using visual cues such as picture and/or word schedules for those who have difficulty staying on task; etc.
D) Providing Physical assistance.	Many times, in case of infrastructural or technology constraints, students with special needs; require assistance from another person to participate in a classroom activity. If possible, we must use natural supports (peers/ support teacher/ paraprofessional/ classroom aide/ parent volunteer etc.); however, they will need training in the appropriate way of providing physical assistance. For example: • Assisting a student in a wheelchair move to the next activity. • Starting a computer for student to use. • Assisting in activating a switch; etc
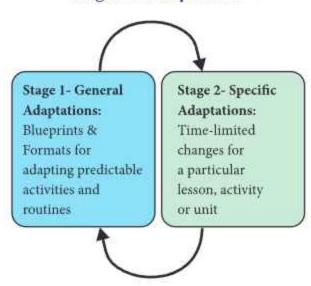
E) Alternative/ Substitute/ Plus curriculum.	This is also sometimes referred to as functional curriculum as it usually involves the acquisition of "life skills." This curriculum may or may not be implemented in the general education classroom, and may include: • Community-based instruction • Learning job skills in the school cafeteria. • Learning how to use a communication device. • Learning cooking/grooming skills at the home. • Orientation & Mobility skills • Learning sign language or reading/writing braille.

Stages of Adaptations

Stage 1- General Adaptations: Blueprints & Formats for adapting predictable activities and routines

Stage 2- Specific Adaptations: Time-limited changes for a particular lesson, activity or unit

Types of Curriculum Adaptations

The goal of any adaptation in curriculum is to help students with special needs to develop the knowledge, skills and attitudes necessary to be autonomous, to integrate into society and to participate in the work force.

The general level of autonomy expected of preschool students will be different from that expected of elementary or secondary school students. The age of the students is therefore a very important factor to consider when choosing themes and activities.

| INPUT	OUTPUT	TIME
Adapt the way instruction is delivered to the student. Eg.: Use of visual aids, giving concrete examples.	Adapt how the student can respond to the instruction. Eg. Allow a verbal instead of written response, allow use of communication book etc.	Allow flexibility of time allotted for learning or, competing the task or for attempting an exam/test. i.e. Individualize time for pace of learning tasks.
DIFFICULTY LEVEL	**LEVEL OF SUPPORT**	**SIZE OF CURRICULUM**
Adapt the skill level, problem type or the rules on how the student may approach the work. Eg. Allow use of calculator, simplify task instructions,	Increasing the level or amount of personal assistance or support with the student. Eg. Assigning peer buddies, peer tutor, providing verbal or physical assistance etc.	Adapt the number of items/ tasks that the student is expected to learn or complete. Eg. Reducing or limiting the number of chapters in a subject etc.
DEGREE OF PARTICIPATION	**ALTERNATE GOALS**	**ALTERNATE CURRICULUM**
Adapt the extent to which the learner is actively involved in the task. Eg. In geography, have the student hold the globe, while others point out the locations etc.	Adapt the goals or outcomes expected while using the same material/ curriculum. Eg. In social studies, expect one student to locate just the states while others learn to also identify their capitals.	Providing different content of instructions, materials &individual goals. Eg. While others learn fractions and ratios in curriculum; a child with special needs may only have functional arithmetic like reading clock, money transaction etc. in curriculum
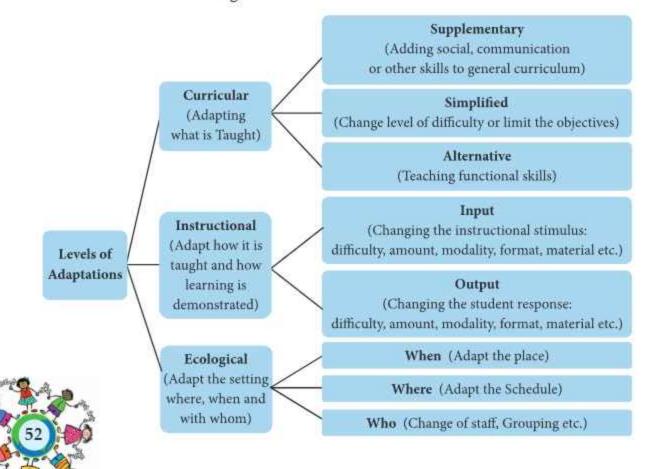
Levels of Adaptations

Any form of curricular adaptation lead to new educational possibilities for children with special needs and makes further or higher education a realistic pursuit for many students. Therefore

In order to design a well-suited curriculum adaptation, combinations of varying levels of content and objective modifications must be selected based on the individual student's needs. The researchers suggested that, while developing adaptations; teachers need to be mindful of the following thoughts:

(a) the students' unique differences should be valued,

(b) not all students need to be doing the same thing at the same time,

(c) educational team contribute uniquely to planning & implementation of the process, and

(d) all students should belong in the age-appropriate general education class.

Also, for successful curriculum adaptations, team members need to understand students' IEPs, plan in advance, expand their knowledge of curriculum, and collaborate with one other; for designing adaptations at the following levels:

Levels of Adaptations

- **Curricular** (Adapting what is Taught)
  - **Supplementary** (Adding social, communication or other skills to general curriculum)
  - **Simplified** (Change level of difficulty or limit the objectives)
  - **Alternative** (Teaching functional skills)
- **Instructional** (Adapt how it is taught and how learning is demonstrated)
  - **Input** (Changing the instructional stimulus: difficulty, amount, modality, format, material etc.)
  - **Output** (Changing the student response: difficulty, amount, modality, format, material etc.)
- **Ecological** (Adapt the setting where, when and with whom)
  - **When** (Adapt the place)
  - **Where** (Adapt the Schedule)
  - **Who** (Change of staff, Grouping etc.)

For success of Adaptations

It is important to acknowledge that individual students may require access to some or all options throughout a school day or even in one task. The options should be viewed as being fluid rather than static. Remember the principle of **using the least intrusive option available** that meets the student's needs.

Shifting teacher beliefs and actions is an important focus for inclusive practice because it can support or limit a student's access to learning. As teachers build towards inclusive practice their beliefs and attitudes become more inclusive and they move away from practices that limit learning opportunities for everyone.

Moving from	*Moving to*
Low expectations of student learning, progress, and achievement	High expectations of student learning, progress, and achievement
A one-size-fits-all curriculum	Curriculum access that may differ for different students, but curriculum for all
A belief that "It's not a classroom teacher's job to teach 'these' students."	A belief that the learning of all students is the responsibility of all teachers
An attitude that any student with special education needs will require a teacher's aide	Support in the classroom that is coordinated and appropriate
The teacher's aide working with the student	The teacher's aide supporting the teacher to include all students
A belief that "These students do not belong in a mainstream class, they belong in the unit."	A belief that all students belong in the mainstream classroom
Teachers feeling isolated	Coordinated support for teachers and students
	Collaborative planning with the special education expert, student, and parent
Someone else planning for students with special education needs	
Restricted options and pathways post school	Meaningful pathways supporting active role, full participation, and lifelong learning

For Sensory Impairment

Visual Impairments

Curricular adaptations like duplication of printed material of text book in Braille or large print is deemed necessary. Where necessary content material is modified as per the specific requirement of the child like tactile material, embossed worksheets etc. Content which cannot be modified is substituted with appropriate content.

Assessment Before admission, the child is assessed for his/her functional skills. Academic level of the child is assessed according to his/her age group. Assessment of mobility (independent travelling), gross, fine motor skills and knowledge of Braille reading/writing skills depending on the age is also carried out. Consulation with parents also provides useful inputs. Intervention

Once the children are diagnosed with visual impairment the Special Educator provides orientation in mobility and Braille training in Special section so that these children can be integrated into a regular class.

- Initially the main focus of OTs and special educators is on making the child independent in activities of daily living. Special educator along with parents plan "home training programme".

- Orientation and mobility training is given to the child following "keep to the left- rule" to make him/her independent and safe in moving from one place to the other.

- Training in the use of white- cane is given to children who are totally blind to locate obstacles along the route and provide information about the surroundings for independent travelling.

- Braille training (reading and writing) and Braille books are given to those who are totally blind and those who cannot read and write in print.

- Large print books, talking calculators, magnifying devices like magnifying sheet and glass, computer software- Jawa, talking books etc. are provided as per specific needs.

- OT provides sensory training and helps in enhancing the other senses: tactile, auditory and proprioception to improve learning from the environment and one's own body. It is given to the child so that he/she can adequately gather information from the environment. Special efforts are made to nurture and promote musical skills- vocal and instrumental.

- Children are encouraged to participate in dancing and cultural activities.

- Sports activities are the integral part of our curriculum. Children are motivated to participate in various sports activities like-cricket, informal games like hide and seek, musical chairs, integrated sports activities like- bowling, three legged race and recreational sports.

- Children with Low vision are seated in the front row in class for better view of the black board.

- Children who are totally blind are seated in second and third row so that they can listen to the teacher uninterrupted.

- Peer group acceptance starting at an early age also helps in making inclusion effective.

- During examination, a printed question paper is translated into Braille. Children's Braille answer sheets are translated into print by the special educator.

- There is an option of oral testing for children who cannot read and write in Braille.

- Library is equipped with reading material in Braille, Multi- Media, TV, Tactile Globe, etc.

Hearing Impairments:

Following are suggestions for inclusion and curricular adaptation for children with hearing impairment:

- **Let them be made welcome** and to belong where successful social relationships can occur. Smiled at, introduced, given time to talk and share personal information, find other people with common interests, invited to extra-curricular activities.

- **Expand their ability to communicate with others.** Encouraged and actively taught communication skills or questioning, listening, speaking, reporting, reading, writing for all sorts of occasions.

- **Challenge them to take risks and grow.** Lots of praise, encouragement, high personal-interest work.

- **Give opportunities for experiential and incidental learning.** First hand experience (labs, workshops, dramatizations, projects) field trips, team projects, group or paired activities.

- **Provide as much visual access to information as possible.** Board notes, handouts, glossaries, course books, multi-media materials, closed captioning, hands-on research, other students' notes, pictures.

- **Give assistive listening devices, and appropriate technology, made available.** FM systems, phone amplifiers, silent overhead projectors, closed caption decoders.

- **Ensure classroom which provides the optimum listening environment.** Low general noise level, not beside a gymnasium or band room.

- **Take responsibility for learning** (help plan, produce, assess). Be made aware of strengths, learning styles, interests, and goals for growth and improvement; encouraged to keep a portfolio of work in progress; opportunities for periodic assessment and new goals.

- **Have optimum lighting situations.** Faces of peers and teacher need to be clearly lit for speech reading. Ensure peers and others speak clearly and normally and ctly with them.

- **Ask questions and expect full participation in the classroom.** Teach questioning skills, share class work equitably.

- **Provide opportunities to work cooperatively in groups.** To extend communication skills (paraphrasing, reporting, summarizing) and experiences.

6. Curriculum Adaptation with Examples/Lesson Plans/Activities

Training General Education Teachers

"All teachers have a need be trained and prepared for the inclusion of special needs students in the genetal education population" (Cavanaugh, n.d.).

Why Train General Education Teachers?

It is very important to train general education teachers to be able to be effective educators in the inclusion classroom. Because inclusion classrooms are becoming a popular method of instructing students with disabilities, general education teachers need to be aware of methods, strategies, and resources that will prepare teachers to instruct all students. It is not enough for teachers to simply know their content area, such as math or English, but teachers should also be prepared to work with students of all different abilities.

Major Issues and Areas of concerns :

Some of the major areas of discussion regarding training general education teachers to be effective instructors in the inclusion classroom setting
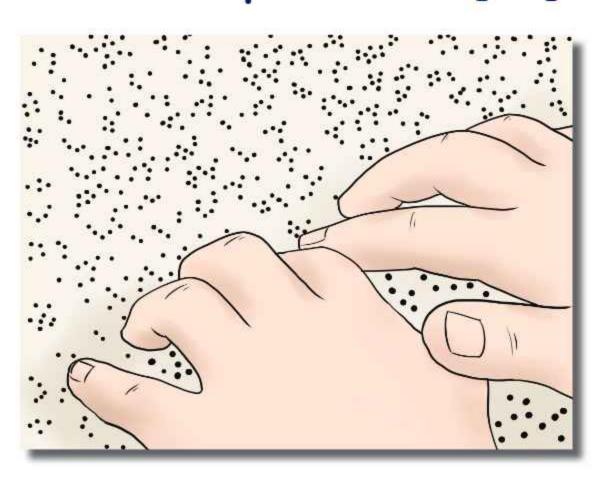
include the **need for accountability in regard to further education** about how to teach students with special needs based on the increasing popularity of inclusion classrooms in the general education setting in addition to addressing the question of **what can help prepare pre-service teachers** to be instructors in inclusion classrooms. It is very important that pre-service teacher education programs focus on providing appropriate instruction to those who will be instructing students will special needs because even if these teachers will be in a general education classroom, it is incredibly likely that general education teachers will be working in an inclusion classroom.

A special education teacher who does not teach core academic subjects if the special education teacher:
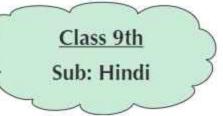
(1) is a *co-teacher* who:

    (A) *works within the general education setting in which a highly qualified general education teacher provides instruction to the class on core academic elementary content or a core academic middle, junior high, or high school subject; and*

    (B) *provides direct assistance to students with disabilities via individualized or small group instruction as a support to the highly qualified teacher's instruction;*

(2) is a *consultant teacher who provides consultation, such as:*

    (A) *adapting curricula;*

    (B) using behavioral supports and interventions; and

    (C) *selecting appropriate accommodations; to highly qualified general education teachers of core academic elementary content or a core middle, junior high, or high school academic subject;*

(3) is a *resource room teacher who provides direct assistance to students with disabilities, such as tutoring and reinforcement of content provided in the general education setting, in segregated settings after the students receive instruction on core academic elementary content or a core academic middle, junior high, or high school subject from a highly qualified general education teacher; or*

(4) **provides direct instruction** *to students with disabilities on noncore academic subjects, such as;*

    (A) *life skills;*

    (B) *study skills; and*

    (C) *community based instruction*

Adaptation for Children with Visual Impairement [VI]

गिल्लू

महादेवी वर्मा

सोनजुही[1] में आज एक पीली कली लगी है। इसे देखकर अनायास[2] ही उस छोटे जीव का स्मरण हो आया, जो इस लता की सघन हरीतिमा[3] में छिपकर बैठता था और फिर मेरे निकट पहुँचते ही कंधे पर कूदकर मुझे चौंका देता था। तब मुझे कली की खोज रहती थी, पर आज उस लघुप्राण[4] की खोज है।

परंतु वह तो अब तक इस सोनजुही की जड़ में मिट्टी होकर मिल गया होगा। कौन जाने स्वर्णिम कली के बहाने वही मुझे चौंकाने ऊपर आ गया हो!

अचानक एक दिन सवेरे कमरे से बरामदे में आकर मैंने देखाए दो कौवे एक गमले के चारों ओर चोंचों से छुआ-छुऔवल[5] जैसा खेल खेल रहे हैं। यह काकभुशुंडि भी विचित्र पक्षी है-एक साथ समादरित[6], अनादरित[7], अति सम्मानित, अति अवमानित।

1. जुही (पुष्प) का एक प्रकार जो पीला होता है।
2. अचानक
3. हरियाली
4. छोटा जीव
5. चुपके से छुकर छुप जाना और फिर छुना
6. विशेष आदर
7. आदर का अभाव, तिरस्कार

हमारे बेचारे पुरखे न गरूड़ के रूप में आ सकते हैं, न मयूर के, न हंस के। उन्हें पितरपक्ष में हमसे कुछ पाने के लिए काक बनकर ही अवतीर्ण[8] होना पड़ता है। इतना ही नहीं हमारे दूरस्थ प्रियजनों को भी अपने आने का मधु संदेश इनके कर्कश[9] स्वर में ही देना पड़ता है। दूसरी ओर हम कौवा और काँव-काँव करने को अवमानना के अर्थ में ही प्रयुक्त करते हैं।

मेरे काकपुराण के विवेचन में अचानक बाधा आ पड़ी, क्योंकि गमले और दीवार की संधि में छिपे एक छोटे-से जीव पर मेरी दृष्टि रूक गई। निकट जाकर देखा, गिलहरी का छोटा-सा बच्चा है जो संभवतः घोंसले से गिर पड़ा है और अब कौवे जिसमें सुलभ आहार खोज रहे हैं।

काकद्वय[10] की चोंचों के दो घाव उस लघुप्राण के लिए बहुत थे, अतः वह निश्चेष्ट[11]-सा गमले से चिपटा पड़ा था।

सबने कहा, कौवे की चोंच का घाव लगने के बाद यह बच नहीं सकता, अतः इसे ऐसे ही रहने दिया जाए।

परंतु मन नहीं माना-उसे हौले से उठाकर अपने कमरे में लाई, फिर रूई से रक्त पोंछकर घावों पर पेंसिलिन का मरहम लगाया।

रूई की पतली बत्ती दूध से भिगोकर जैसे-तैसे उसके नन्हे से मुँह में लगाई पर मुँह खुल न सका और दूध की बूँदें दोनों ओर ढुलक गईं।

कई घंटे के उपचार के उपरांत उसके मुँह में एक बूंद पानी टपकाया जा सका। तीसरे दिन वह इतना अच्छा और आश्वस्त[12] हो गया कि मेरी उँगली अपने दो नन्हे पंजों से पकड़कर, नीले काँच के मोतियों जैसी आँखों से इधर-उधर देखने लगा।

तीन-चार मास में उसके स्निग्ध[13] रोएँ झब्बेदार पूँछ और चंचल चमकीली आँखें सबको विस्मित[14] करने लगीं।

हमने उसकी जातिवाचक संज्ञा को व्यक्तिवाचक का रूप दे दिया और इस प्रकार हम उसे गिल्लू कहकर बुलाने लगे। मैंने फूल रखने की एक हलकी डलिया में रूई बिछाकर उसे तार से खिड़की पर लटका दिया।

वही दो वर्ष गिल्लू का घर रहा। वह स्वयं हिलाकर अपने घर में झूलता और अपनी काँच के मनकों-सी आँखों से कमरे के भीतर और खिड़की से बाहर न जाने क्या देखता-समझता रहता था। परंतु उसकी समझदारी और कार्यकलाप पर सबको आश्चर्य होता था।

जब मैं लिखने बैठती तब अपनी ओर मेरा ध्यान आकृर्षित करने की उसे इतनी तीव्र इच्छा होती थी कि उसने एक अच्छा उपाय खोज निकाला।

संज्ञा के जातिवाचक संज्ञा व व्यक्तिवाचक संज्ञा के भेद को उदाहरण द्वारा समझाना। जैसे—कक्षा के सभी छात्र जातिवाचक संज्ञा के अन्तर्गत एवं किसी एक छात्र का नाम व्यक्ति-वाचक संज्ञा के अन्तर्गत आएगा।

8. प्रकट
9. कटु कला का न भाव रखना
10. दो कौए
11. बिना किसी हरकत के
12. निश्चित
13. चिकना
14. आश्चर्यचकित

वह मेरे पैर तक आकर सर्र से परदे पर चढ़ जाता और फिर उसी तेजी से उतरता। उसका यह दौड़ने का क्रम तब तक चलता जब तक मैं उसे पकड़ने के लिए न उठती।

कभी मैं गिल्लू को पकड़कर एक लंबे लिफाफे में इस प्रकार रख देती कि उसके अगले दो पंजों और सिर के अतिरिक्त सारा लघुगात[15] लिफाफे के भीतर बंद रहता। इस अद्भुत स्थिति में कभी-कभी घंटों मेज पर दीवार के सहारे खड़ा रहकर वह अपनी चमकीली आँखों से मेरा कार्यकलाप देखा करता।

भूख लगने पर चिक-चिक करके मानो वह मुझे सूचना देता और काजू या बिस्कुट मिल जाने पर उसी स्थिति में लिफाफे से बाहर वाले पंजों से पकड़कर उसे कुतरता रहता।

फिर गिल्लू के जीवन का प्रथम बसंत आया। नीम-चमेली की गंध मेरे कमरे में हौले-हौले आने लगी। बाहर की गिलहरियां खिड़की की जाली के पास आकर चिक-चिक करके न जाने क्या कहने लगीं?

गिल्लू को जाली के पास बैठकर अपनेपन से बाहर झाँकते देखकर मुझे लगा कि इसे मुक्त करना आवश्यक है।

मैंने कीलें निकालकर जाली का एक कोना खोल दिया और इस मार्ग से गिल्लू ने बाहर जाने पर सचमुच ही मुक्ति की साँस ली। इतने छोटे जीव को घर में पले कुत्ते, बिल्लियों से बचाना भी एक समस्या ही थी।

आवश्यक कागज-पत्रों के कारण मेरे बाहर जाने पर कमरा बंद ही रहता है। मेरे कालेज से लौटने पर जैसे ही कमरा खोला गया और मैंने भीतर पैर रखा, वैसे ही गिल्लू अपने जाली के द्वार से भीतर आकर मेरे पैर से सिर और सिर से पैर तक दौड़ लगाने लगा। तब से यह नित्य का क्रम हो गया।

मेरे कमरे से बाहर जाने पर गिल्लू भी खिड़की की खुली जाली की राह बाहर चला जाता और दिन भर गिलहरियों के झुंड का नेता बना हर डाल पर उछलता-कूदता रहता और ठीक चार बजे वह खिड़की से भीतर आकर अपने झूले में झूलने लगता।

मुझे चौंकाने की इच्छा उसमें न जाने कब और कैसे उत्पन्न हो गई थी। कभी फूलदान के फूलों में छिप जाताए कभी परदे की चुन्नट में और कभी सोनजुही की पत्तियों में।

मेरे पास बहुत से पशु-पक्षी हैं और उनका मुझसे लगाव भी कम नहीं है, परंतु उनमें से किसी को मेरे साथ मेरी थाली में खाने की हिम्मत हुई है, ऐसा मुझे स्मरण नहीं आता।

गिल्लू इनमें अपवाद[16] था। मैं जैसे ही खाने के कमरे में पहुँचती, वह खिड़की से निकलकर आँगन की दीवार, बरामदा पार करके मेज पर पहुंच जाता और मेरी थाली में बैठ जाना चाहता। बड़ी कठिनाई से मैंने उसे थाली के पास बैठना सिखाया जहां बैठकर वह मेरी थाली में से एक-एक चावल उठाकर

"गिलहरी की आवाज सुनना समझना, पहचानना एवं अन्य जानवरों की आवाजों के बीच अन्तर की पहचान"

"गंध जैसी प्रत्यय में प्रत्यक्ष पहचान कराना जैसे नीम चमेली, चूही एवं फूलों की गंध"

15. छोटा शरीर
16. सामान्य नियम को बाधित या मर्यादित करने वाला

बड़ी सफ़ाई से खाता रहता। काजू उसका प्रिय खाद्य[17] था और कई दिन काजू न मिलने पर वह अन्य खाने की चीज़ें या तो लेना बंद कर देता या झूले से नीचे फेंक देता था।

उसी बीच मुझे मोटर दुर्घटना में आहत होकर कुछ दिन अस्पताल में रहना पड़ा। उन दिनों जब मेरे कमरे का दरवाज़ा खोला जाता गिल्लू अपने झूले से उतरकर दौड़ता और फिर किसी दूसरे को देखकर उसी तेज़ी से अपने घोंसले[18] में जा बैठता। सब उसे काजू दे आते, परंतु अस्पताल से लौटकर जब मैंने उसके झूले की सफ़ाई की तो उसमें काजू भरे मिले, जिनसे ज्ञात होता था कि वह उन दिनों अपना प्रिय खाद्य कितना कम खाता रहा।

मेरी अस्वस्थता में वह तकिए पर सिरहाने बैठकर अपने नन्हे-नन्हे पंजों से मेरे सिर और बालों को इतने हौले-हौले सहलाता रहता कि उसका हटना एक परिचारिका[19] के हटने के समान लगता।

गरमियों में जब मैं दोपहर में काम करती रहती तो गिल्लू न बाहर जाता न अपने झूले में बैठता। उसने मेरे निकट रहने के साथ गरमी से बचने का एक सर्वथा नया उपाय खोज निकाला था। वह मेरे पास रखी सुराही पर लेट जाता और इस प्रकार समीप भी रहता और ठंडक में भी रहता।

गिलहरियों के जीवन की अवधि दो वर्ष से अधिक नहीं होती, अतः गिल्लू की जीवन यात्रा का अंत आ ही गया। दिन भर उसने न कुछ खाया न बाहर गया। रात में अंत की यातना में भी वह अपने झूले से उतरकर मेरे बिस्तर पर आया और ठंडे पंजों से मेरी वही उँगली पकड़कर हाथ से चिपक गया। जिसे उसने अपने बचपन की मरणासन्न[20] स्थिति में पकड़ा था। पंजे इतने ठंडे हो रहे थे कि मैंने जागकर हीटर जलाया और उसे उष्णता[21] देने का प्रयत्न किया। परंतु प्रभात की प्रथम किरण के स्पर्श के साथ ही वह किसी और जीवन में जागने के लिए सो गया।

उसका झूला उतारकर रख दिया गया है और खिड़की की जाली बंद कर दी गई है, परंतु गिलहरियों की नयी पीढ़ी जाली के उस पार चिक-चिक करती ही रहती है और सोनजुही पर बसंत आता ही रहता है।

सोनजुही की लता के नीचे गिल्लू को समाधि दी गई है - इसलिए भी कि उसे वह लता सबसे अधिक प्रिय थी - इसलिए भी कि उस लघुगात का, किसी वासंती दिन, जुही के पीताभ[22] छोटे फूल में खिल जाने का विश्वास, मुझे संतोष देता है।

17. भोजन
18. नीड़, रहने की जगह
19. सेविका
20. जिसकी मृत्यु निकट हो, मृत्यु के समीप पहुंचा हुआ
21. गरमी
22. पीले रंग का

"कुछ और पालतु जानवरों की पहचान माडल द्वारा यह प्रत्यक्ष अनुभवों द्वारा देना। जैसे बिल्ली या कुत्ता प्रत्यय को उनको स्पर्श एवं आवाज़ द्वारा भेद करता।"

"समरण शक्ति को बढ़ाने एवं दृढ़ करने हेतु बच्चों से भी कुछ संस्मरण सुने जाएं। खासकर मौसम के अनुसार, जैसे—कुछ गर्मी के मौसम के, कुछ ठंड के मौसम के संस्मरण सुनना"

बोध-प्रश्न

1. सोनजुही में लगी पीली कली को देख लेखिका के मन में कौन से विचार उमड़ने लगे?

2. पाठ के आधार पर कौए को एक साथ समादरित और अनादरित प्राणी क्यों कहा गया है?

3. गिलहरी के घायल बच्चे का उपचार किस प्रकार किया गया?

मूल्यांकन

छात्र प्रश्नोत्तर बेल में करेंगे, अथवा मौखिक।

* कठिन शब्दों के अर्थ बताना।

    अनायास, लघुप्राण, अवतीर्ण, अनादरित, कर्कश।

प्रश्न अनुकूलन

1. पाठ की लेखिका का नाम बताइये। (पाठक लेखिका)

2. लेखिका ने कौन सा फूल देखा?

3. सोन जूही को देखकर लेखिका के मन में किस जीव से सम्बद्ध विचार उमड़ें?

4. कौआ को समादरित प्राणी क्यों माना गया है?

5. किन गुणों के कौए को अनादरित प्राणी कहा गया है?

6. गिलहरी के घायल बच्चे का उपचार किस प्रकार किया गया?

7. गिलहरी के बच्चे को लेखिका द्वारा क्या नाम दिया गया?

8. गिल्लू को मुक्त करने की आवश्यकता क्यों समझी गई?

9. लेखिका ने गिल्लू की मुक्ति के लिए क्या उपाय किया?

10. सोनजुही की लता के नीचे बनी गिल्लू की समाधि से लेखिका के मन में किस विश्वास का जन्म होता है?

बहुविकल्पीय प्रश्न

(i) हमारे पुरखे किस रूप में आते हैं?

(1) गरूड़ (2) मोर (3) काक (4) हंस

(ii) निम्न शब्दों में व्यक्तिवाचक संज्ञा शब्द कौन सा है?

(1) कौआ (2) कुत्ता (3) गिल्लू (4) गिलहरी

(iii) जातिवाचक संज्ञा शब्द कौन सा है?

  (1) गिल्लू (2) गिलहरी (3) सोन जुड़ी (4) लघुप्राण

(iv) 'जीवन में जागने' का अर्थ है?

  (1) मृत्यु (2) जन्म (3) पुनर्जन्म (4) जागना

गृह कार्य

* महादेवी वर्मा तथा अन्य प्रसिद्ध लेखकों के जीवन वृत के बारे में बताना तथा छात्रों को पढ़ने के लिए प्रोत्साहित करना।

* छात्रों को प्राकृतिक वातावरण में ले जाकर प्राकृतिक वस्तुओं का बोध करवना।

* क्षेत्र भ्रमण (माता-पिता के साथ)।

* माता-पिता के साथ चिड़ियाघर की सैर पर जाएं तथा छात्रों को विभिन्न पशु पक्षियों की आवाजों का बोध कराना।

* विभिन्न पशु पक्षियों से सम्बन्धित छोटी छोटी कहानियाँ सुनाना।

* छात्र घर में छोटे छोटे पशु पक्षियों को पाल सकते हैं, जिससे उनमें दया भाव का विकास हो।

* छात्रों से छोटे-छोटे पशु पक्षियों के बारे में पूछा जाएगा तथा उनके विभेदीकरण करने को कहा जाएगा।

Adapted HW for VI

1. पशु पक्षियों से जुड़ा या कोई अन्य संस्मरण अपने शब्दों में लिखकर लाएं।
2. लिखित संस्मरण को अपने शब्दों में सुनाएं।
3. कठिन शब्दों के अर्थ याद कर कक्षा में सुनाएं।

पाठ आधारित क्रिया कलाप

1. कक्षा में छात्रों द्वारा पाठ का नाट्य रूपान्तरण कराया जाए।
2. कुछ छात्र फूल, पशु एवं पक्षियों की भूमिका निभांएगे।
3. एक छात्र महादेवी वर्मा की भूमिका निभाते हुए उनके जीवन वृतांत व कृतियों का उल्लेख करे।
4. पाठ को पढ़कर अपने मन में उत्पन्न भावों व विचारों को छात्र अपने शब्दों में बताएंगे।

संसाधन एवं विकास

सामान्य उद्देश्य

1. छात्रों में सामाजिक विज्ञान विषय के प्रति रुचि पैदा करना।

2. छात्रों में अपने देश के विषय में भौगोलिक जानकारी बढ़ाना।

3. छात्र भारत के भौगोलिक विस्तार को समझ सकेंगे।

4. छात्र भारत के पड़ोसी देशों के विषय में जान सकेंगे।

5. छात्र भारत की अर्थव्यवस्था के विषय में जान सकेंगे।

विशिष्ट उद्देश्य

1. छात्र संसाधन के बारे में समझ सकेंगे।

2. छात्र संसाधन के महत्व को समझ सकेंगे।

3. छात्र विभिन्न संसाधनों के बीच अन्तर कर सकेंगे।

4. छात्र संसाधनों के उपयोग एवं नियोजन के बारे में जान समझ सकेंगे।

5. छात्र अपने आस-पास के संसाधनों को पहचान सकेंगे।

6. छात्र गाँवों और शहरों में हमारे जीवन को आराम पहुँचाने वाली वस्तुओं के बारे में बता सकेंगे।

शिक्षक के लिए सामान्य निर्देश

1. दृष्टिबाधित एवं अल्प दृष्टि छात्रों को आगे की पंक्ति में बैठाना।

2. छात्रों को सामान्य छात्रों के समान ही ब्रेल एवं Large Font वाली किताबों से पढ़ने के लिए प्रेरित करना।

3. अल्प दृष्टि के छात्रों के शिक्षण सहायक सामग्री में रंग संयोजन का ध्यान।

4. दृष्टिबाधित छात्रों की शिक्षण सहायक सामग्री उभरी हुई, मुलायम एवं ब्रेल में हो।

5. शिक्षण करते समय शब्दों का उपयुक्त उच्चारण, आवाज का उचित उतार चढाव व आवाज का स्पष्ट होना।

पाठ अनुकूलन

1. चित्र 1.1 की उभरी हुई आकृति बनाना।

2. संसाधनों के वर्गीकरण को अलग-अलग चार्ट पर ब्रेल में उदाहरण के साथ।
   जैसे (क) उत्पत्ति के आधार पर – जैव-मनुष्य, पेड़-पौधे, जीव जन्तु।
   अजैव - पहाड़, धातुएँ।

3. चित्र 1.2 को अलग अलग चार्ट पर पाँच भागों में उदाहरण सहित बेल में लिखित। जिसमें संसाधनों के वर्गीकरण को स्पष्ट रूप से विभाजित व प्रदर्शित किया जाए।

4. संसाधनों के वर्गीकरण को समझाने के लिए विभिन्न प्रकार के उदाहरण दिये जाएंगे। जैव संसाधनों के प्रस्तुतीकरण के लिए विभिन्न प्रकार की वास्तविक वनस्पति व छोटे-छोटे पेड़ पौधों का प्रयोग किया जाए। चट्टान का प्रत्यय निर्माण करने हेतु प्लास्टर ऑफ पेरिस से चट्टान व मॉडल द्वारा प्रदर्शन किया जाए। विभिन्न प्रकार की धातुओं को स्पर्श कराकर प्रत्यय निर्माण कराना। विभिन्न प्रकार की धातु से बनी वस्तुएँ जैसे स्टील की, लोहे की, तांबे इत्यादि की वस्तुओं को स्पर्श करा कर तथा उनके भार के अन्तर को स्पर्श कर प्रत्यय निर्माण करना।

5. संसाधनों के वर्गीकरण से सम्बन्धित प्रवाह चार्ट को भिन्न भागों में वर्गीकृत किया जाएगा।

6. सर्वप्रथम संसाधनों का वर्गीकरण किया जाएगा–प्राकृतिक व मानवीय।

7. सर्वप्रथम प्राकृतिक संसाधनों का वर्गीकरण किया जाएगा जिसमें नवीकरण योग्य व अनवीकरण योग्य संसाधन का वर्गीकरण किया जाएगा। इस वर्गीकरण को भी अन्य वर्गीकरणों में विभाजित किया जाएगा।

8. तत्पश्चात् मानवीय संसाधनों से सम्बन्धित वर्गीकरण किया जाएगा। इस वर्गीकरण में निहित संरचना एवं संस्थाएं तथा मात्रा एवं गुणवत्ता के आधार पर वर्गीकरण किया जाएगा।

9. चित्र 1.3 में निहित मुख्य भू आकृतियों के अन्तर्गत क्षेत्र से संबंध पाई चार्ट को उभरा हुआ बनाया जाएगा। जिसमें मैदान को दर्शाने के लिए मिट्टी या बालू, पर्वत को दर्शाने के लिए

प्लास्टर ऑफ पेरिस या कार्क की बनी हुई पर्वत की आकृति तथा पठार वाले भाग को दर्शाने के लिए माचिस की डिब्बियों द्वारा आकृति बनाकर दर्शाया जाएगा।

10. पाठ में निहित चित्र 1.4 में दर्शाये गये विभिन्न भागों को प्रदर्शित करने के लिए भिन्न वस्तुओं का प्रयोग किया जाएगा। जैसे—वन को दर्शाने के लिए छोटे पेड़ पौधे, बंजर भूमि को दर्शाने के लिए घास का प्रयोग किया जाएगा।

11. चित्र 1.5 में प्रदर्शित जल, वन, लवण व क्षार तथा वायु द्वारा अपरिक्षत क्षेत्रों को विभिन्न प्रकार की सामग्री का प्रयोग कर दर्शाया जाएगा। इस सामग्री के अन्तर्गत बालू, छोटे छोटे पेड़-पौधे तथा अन्य उपयोगी वस्तुओं का प्रयोग किया जाएगा। साथ ही छात्रों को इसका प्रतिशत भी बताया जाएगा।

12. चित्र 1.6 में प्रदर्शित मृदा परिच्छेदिका में प्रदर्शित विभिन्न प्रकार की मृदाओं को दर्शाने के लिए रूई या कोई मुलायम कपड़ा, बालू, गाद, मोटी बालू तथा अन्य प्रकार की चट्टानों का प्रयोग किया जाएगा।

13. पाठ में वर्णित मानचित्र में मृदा के मुख्य प्रकार दर्शाए गए हैं। साथ ही यह भी दर्शाया गया है कि कौन से प्रकार की मृदा भारत के किन भागों व क्षेत्रों में पाई जाती है। इसके प्रदर्शन के लिए सर्वप्रथम भारत के मानचित्र को मोटे धागे या पतली डोरी से उभारा जाएगा। उसके पश्चात् विभिन्न प्रकार की मृदा को दर्शाने के लिए भिन्न-भिन्न चीज़ों जैसे—बालू, मोटा बालू आदि का प्रयोग किया जाएगा।

पाठ आधारित क्रियाकलाप

1. आराम पहुँचाने वाली वस्तुओं का नाम लिखकर बाक्स में डालना फिर एक-एक बच्चों को बुलाकर एक पर्ची निकलवाना एवं इस पर लिखी वस्तु से मिलने वाले आराम के बारे में बताने को कहना। जैसे—जल, वायु, ऊर्जा, वन, मृदा, चट्टानें, धातुएं, वनस्पति।

2. उपर्युक्त क्रिया को दोहराते हुए संसाधनों को उनके संवर्ग के साथ बताना।

3. सभी संवर्ग के संसाधनों पर एक प्रश्नोत्तरी प्रतियोगिता का आयोजन।

4. सभी से अपने घर पर उपयोग होने वाले संसाधनों की सूची बनवाना।

5. अपने-अपने प्रदेशों के मुख्य संसाधनों के बारे में लिखकर लाना एवं मौखिक प्रस्तुति।

6. अपने आस-पास के क्षेत्र में व्यक्तिगत एवं सामुदायिक संसाधनों की सूची तैयार कराना।

7. समूह चर्चा नवीकरण योग्य एवं अनवीकरण योग्य संसाधनों के उपयोग पर।

8. संसाधनों (घरेलू और कृषि संबंधित) के पुनः चक्रण पर समूह चर्चा।

9. भारत के मानचित्र (उभरी) पर विभिन्न संसाधनों के विस्तार के पर चर्चा।

10. अपने आस-पास पायी जाने वाली मिट्टी एवं उसके उगने वाली फसल या पौधों के बारे में तुलनात्मक चर्चा।

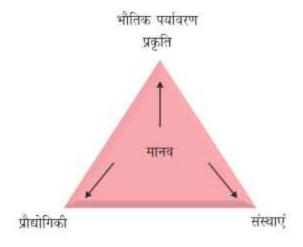11. भारत के मानचित्र (उभरी) पर विभिन्न भागों में पायी जाने वाली मिट्टियों समूह चर्चा।

पाठ आधारित गृह कार्य

1. अपने घर एवं विद्याय के संसाधनों की सूच बनाकर लाना।

2. विभिन्न प्रांतों जैसे–झारखण्ड, मध्यप्रदेश, छत्तीसगढ़, गुजरात में पाये जाने वाले संसाधनों की सूची बनाना एवं याद करना।

3. विभिन्न सर्वंग के संसाधनों को स्मरण करके कक्षा में सुनाना।

4. संसाधनों के महत्व पन निबन्ध लिखना।

5. मिटी संरक्षण पर टिप्पणी लिखना।
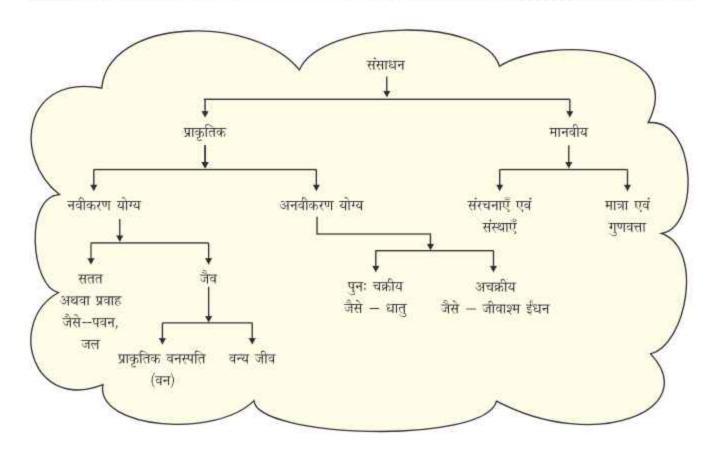

क्रियाकलाप

क्या आप उन वस्तुओं का नाम बता सकते हैं जो गाँवों और शहरों में हमारे जीवन को आराम पहुँचाते है? ऐसी वस्तुओं की एक सूची तैयार करें और इनको बनाने में प्रयोग होने वाले पदार्थों का नाम बताएँ।

हमारे पर्यावरण में उपलब्ध प्रत्येक वस्तु जो हमारी आवश्कताओं को पूरा करने में प्रयुक्त की जा सकती है और जिसको बनाने के लिए प्रौद्योगिकी उपलब्ध है, जो आर्थिक रूप से संभाव्य और सांस्कृतिक रूप से मान्य है, एक 'संसाधन' है। हमारे पर्यावरण में उपलब्ध वस्तुओं की रूपांतरण प्रक्रिया प्रकृति, प्रौद्योगिकी और संस्थाओं के परस्पर अंतर्संबंध में निहित है। मानव प्रौद्योगिकी द्वारा प्रकृति के साथ क्रिया करते हैं और अपने आर्थिक विकास की गति को तेज़ करने के लिए संस्थाओं का निर्माण करते हैं।

चित्र 1.1 – प्रति, प्रौद्योगिक और संस्थाओं के मध्य अंतर्संबंध

चित्र 1.2 – संसाधनों का वर्गीकरण
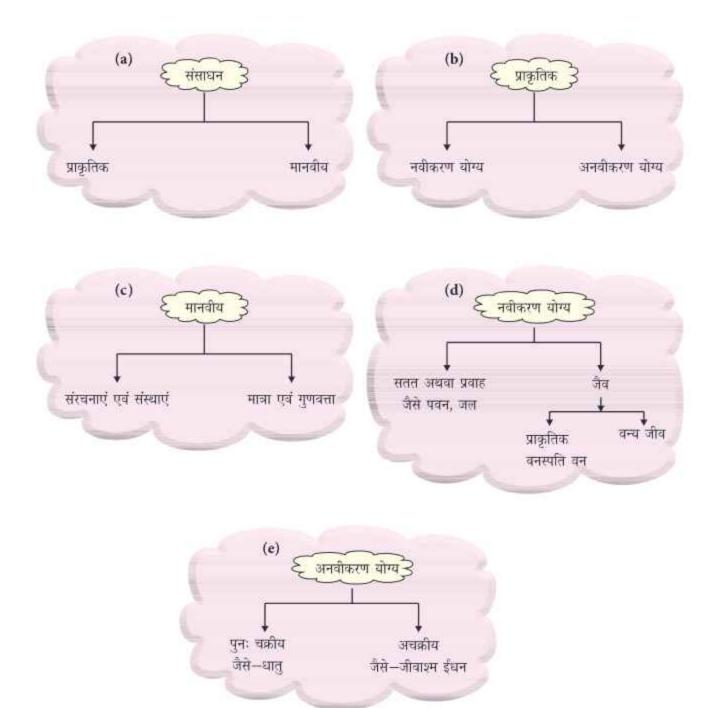
क्या आप भी अन्य बहुत से लोगों की तरह संसाधनों को प्राकृतिक उपहार समझते हैं? ऐसा नहीं है। संसाधन मानवीय क्रियाओं का परिणाम है। मानव स्वयं संसाधनों का महत्त्वपूर्ण हिस्सा हैं। वे पर्यावरण में पाए जाने वाले पदार्थों को संसाधनों में परिवर्तित करते हैं तथा उन्हें प्रयोग करते हैं। इन संसाधनों का वर्गीकरण निम्न प्रकार से किया जा सकता है।

(क) उत्पत्ति के आधार पर – जैव और अजैव

(ख) समाप्यता के आधार पर – नवीकरण योग्य और अनवीकरण योग्य

(ग) स्वामित्व के आधार पर – व्यक्तिगत, सामुदायिक, राष्ट्रीय और अंतर्राष्ट्रीय

(घ) विकास के स्तर के आधार पर – संभावी, विकसित भंडार और संचित कोष

क्रियाकलाप

प्रत्येक संवर्ग से कम से कम दो संसाधनों की पहचान करें।

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(a) संसाधन → प्राकृतिक, मानवीय

(b) प्राकृतिक → नवीकरण योग्य, अनवीकरण योग्य

(c) मानवीय → संरचनाएं एवं संस्थाएं, मात्रा एवं गुणवत्ता

(d) नवीकरण योग्य → सतत अथवा प्रवाह जैसे पवन, जल, जैव → प्राकृतिक वनस्पति वन, वन्य जीव

(e) अनवीकरण योग्य → पुनः चक्रीय जैसे—धातु, अचक्रीय जैसे—जीवाश्म ईंधन

संसाधनों के प्रकार

उत्पत्ति के आधार पर

जैव संसाधन – इन संसाधनों की प्राप्ति जीवमंडल से होती है और इनमें जीवन व्याप्त है, जैसे — मनुष्य, वनस्पतिजात, प्राणिजात, मत्स्य जीवन, पशुधन आदि।

अजैव संसाधन – वे सारे संसाधन जो निर्जीव वस्तुओं से बने हैं, अजैव संसाधन कहलाते हैं। उदाहरणार्थ, चट्टानें और धातुएँ।

समाप्यता के आधार पर

नवीकरण योग्य संसाधन – वे संसाधन जिन्हें भौतिक, रासायनिक या यांत्रिक प्रक्रियाओं द्वारा नवीकृत या पुनः उत्पन्न किया जा सकता है, उन्हें नवीकरण योग्य अथवा पुनः पूर्ति योग्य संसाधन कहा जाता है। उदाहरणार्थ, सौर तथा पवन ऊर्जा, जल, वन व वन्य जीवन। इन संसाधनों को सतत् अथवा प्रवाह संसाधनों में विभाजित किया गया है (चित्र 1.2)।

अनवीकरण योग्य संसाधन – इन संसाधनों का विकास एक लंबे भू-वैज्ञानिक अंतराल में होता है। खनिज और जीवाश्म ईंधन इस प्रकार के संसाधनों के उदाहरण हैं। इनके बनने में लाखों वर्ष लग जाते हैं। इनमें से कुछ संसाधन जैसे धातुएँ पुनः चक्रीय हैं और कुछ संसाधन जैसे जीवाश्म ईंधन अचक्रीय हैं व एक बार के प्रयोग के साथ ही खत्म हो जाते हैं।

स्वामित्व के आधार पर

व्यक्तिगत संसाधन – संसाधन निजी व्यक्तियों के स्वामित्व में भी होते हैं। बहुत से किसानों के पास सरकार द्वारा आवंटित भूमि होती है जिसके बदले में वे सरकार को लगान चुकाते हैं। गाँव में बहुत से लोग भूमि के स्वामी भी होते हैं और बहुत से लोग भूमिहीन होते हैं। शहरों में लोग भूखंड, घरों व अन्य जायदाद के मालिक होते हैं। बाग, चारागाह, तालाब और कुओं का जल आदि संसाधनों के निजी स्वामित्व के कुछ उदाहरण हैं। अपने परिवार के संसाधनों की एक सूची तैयार कीजिए।

सामुदायिक स्वामित्व वाले संसाधन – ये संसाधन समुदाय के सभी सदस्यों को उपलब्ध होते हैं। गाँव की शमिलात भूमि (चारण भूमि, श्मशान भूमि, तालाब इत्यादि) और नगरीय क्षेत्रों के सार्वजनिक पार्क, पिकनिक स्थल और खेल के मैदान, वहाँ रहने वाले सभी लोगों के लिए उपलब्ध हैं।

राष्ट्रीय संसाधन – तकनीकी तौर पर देश में पाये जाने वाले सारे संसाधन राष्ट्रीय हैं। देश की सरकार को कानूनी अधिकार है कि वह व्यक्तिगत संसाधनों को भी आम जनता के हित में अधिग्रहित कर सकती है। आपने देखा होगा कि सड़कें, नहरें और रेल लाइनें व्यक्तिगत स्वामित्व वाले खेतों में बनी हुई हैं। शहरी विकास प्राधिकरणों को सरकार ने भूमि अधिग्रहण का अधिकार दिया हुआ है। सारे खनिज पदार्थ, जल संसाधन, वन, वन्य जीवन, राजनीतिक सीमाओं के अंदर सारी भूमि और 12 समुद्री मील (19.2 किमी.) तक महासागरीय क्षेत्र (भू-भागीय समुद्र) व इसमें पाए जाने वाले संसाधन राष्ट्र की संपदा हैं।

संसाधनों के वर्गीकरण को समझाने के लिए विभिन्न उदाहरण दिये जाए। जैव संसाधनों के प्रस्तुतीकरण के लिए विभिन्न प्रकार की वनस्पति व छोटे-छोटे पेड़ पौधे का प्रयोग/ चट्टानों के उदाहरण के लिए प्लास्टर ऑफ पेरिस से बनी हुई चट्टान का माडल। विभिन्न प्रकार की धातुओं को स्पर्श कराकर प्रत्यय निर्माण करना। विद्यालय में प्रयुक्त घंटा, खम्बा इत्यादि।

इसमें चट्टानों के उदाहरण के लिए प्लास्टर आफ पेरिस का छोटा मॉडल बनाया जाए धातु को समझाने के लिए किसी भी धातु का प्रस्तुतीकरण जैसे लोहा, एल्युमिनियम, तांबा इत्यादि।

छात्रों को वास्तविक वातावरण जैसे पार्क व पिकनिक ले जाकर उनके मनोरंजन के साथ-साथ प्रत्यय निर्माण करना।

अंतर्राष्ट्रीय संसाधन – कुछ अंतर्राष्ट्रीय संस्थाएँ संसाधनों को नियंत्रित करती हैं। तट रेखा से 200 किमी. की दूरी (अपवर्जक आर्थिक क्षेत्र) से परे खुले महासागरीय संसाधनों पर किसी देश का अधिकार नहीं है। इन संसाधनों को अंतर्राष्ट्रीय संस्थाओं की सहमति के बिना उपयोग नहीं किया जा सकता।

क्या आप जानते है?

क्या आप जानते हैं कि भारत के पास अपवर्जक आर्थिक क्षेत्र से दूर हिन्द महासागर की तलहटी से मैंगनीज़ ग्रंथियों का खनन करने का अधिकार है। कुछ अन्य अंतर्राष्ट्रीय संसाधनों की पहचान करें।

राष्ट्रीय व अन्तर्राष्ट्रीय संसाधनों को समझाने के लिए खनिज पदार्थ, जल संसाधन, वन, वन्य जवन राजनीतिक सीमाओं आदि से सम्बान्धित मानचित्र व 3D मॉडल का प्रयोग।

विकास के स्तर के आधार पर

संभावी संसाधन – यह वे संसाधन हैं जो किसी प्रदेश में विद्यमान होते हैं परंतु इनका उपयोग नहीं किया गया है। उदाहरण के तौर पर भारत के पश्चिमी भाग, विशेषकर राजस्थान और गुजरात में पवन और सौर ऊर्जा संसाधनों की अपार संभावना है, परंतु इनका सही ढंग से विकास नहीं हुआ है।

विकसित संसाधन – वे संसाधन जिनका सर्वेक्षण किया जा चुका है और उनके उपयोग की गुणवत्ता और मात्रा निर्धारित की जा चुकी है, विकसित संसाधन कहलाते हैं। संसाधनों का विकास प्रौद्योगिकी और उनकी संभाव्यता के स्तर पर निर्भर करता है।

भंडार – पर्यावरण में उपलब्ध वे पदार्थ जो मानव की आवश्यकताओं की पूर्ति कर सकते हैं परंतु उपयुक्त प्रौद्योगिकी के अभाव में उसकी पहुँच से बाहर हैं, भंडार में शामिल हैं। उदाहरण के लिए, जल दो ज्वलनशील गैसों, हाइड्रोजन और ऑक्सीजन का यौगिक है तथा यह ऊर्जा का मुख्य स्रोत बन सकता है। परंतु इस उद्देश्य से, इनका प्रयोग करने के लिए हमारे पास आवश्यक तकनीकी ज्ञान नहीं है।

भूमण्डलीय तापन, ओजोन परत अवक्षय आदि को समझाने के लिए 3D माडल का प्रयोग किया जा सकता है।

संचित कोष – यह संसाधन भंडार का ही हिस्सा है, जिन्हें उपलब्ध तकनीकी ज्ञान की सहायता से प्रयोग में लाया जा सकता है, परंतु इनका उपयोग अभी आरंभ नहीं हुआ है। इनका उपयोग भविष्य में आवश्यकता पूर्ति के लिए किया जा सकता है। नदियों के जल को विद्युत पैदा करने में प्रयुक्त किया जा सकता है, परंतु वर्तमान समय में इसका उपयोग सीमित पैमाने पर ही हो रहा है। इस प्रकार बाँधों में जल, वन आदि संचित कोष हैं जिनका उपयोग भविष्य में किया जा सकता है।

क्रियाकलाप

अपने आस-पास के क्षेत्र में पाए जाने वाले भंडार और संचित कोष संसाधनों की एक सूची तैयार कीजिए।

संसाधनों का विकास

संसाधन जिस प्रकार, मनुष्य के जीवन यापन के लिए अति आवश्यक हैं, उसी प्रकार जीवन की गुणवत्ता बनाए रखने के लिए भी महत्त्वपूर्ण हैं। ऐसा विश्वास किया जाता था कि संसाधन प्रकृति की देन है। परिणामस्वरूप, मानव ने इनका अंधाधुंध उपयोग किया है, जिससे निम्नलिखित मुख्य समस्याएँ पैदा हो गई हैं।

- कुछ व्यक्तियों के लालचवश संसाधनों का ह्रास

- संसाधन समाज के कुछ ही लोगों के हाथ में आ गए हैं, जिससे समाज दो हिस्सों संसाधन संपन्न एवं संसाधनहीन अर्थात् अमीर और गरीब में बँट गया।

- संसाधनों के अंधाधुंध शोषण से वैश्विक पारिस्थिति की संकट पैदा हो गया है जैसे भूमंडलीय तापन, ओजोन परत अवक्षय, पर्यावरण प्रदूषण और भूमि निम्नीकरण आदि हैं।

क्रियाकलाप

1. कल्पना करें कि तेल संसाधन खत्म होने पर इनका हमारी जीवन शैली पर क्या प्रभाव होगा?

2. घरेलू और कृषि संबंधित अपशिष्ट को पुनः चक्रण करने के बारे में लोगों के विचार जानने के लिए अपने मोहल्ले अथवा गाँव में एक सर्वेक्षण करें। लोगों से प्रश्न पूछें कि—

   (अ) उनके द्वारा उपयोग में लाए जाने वाले संसाधनों के बारे में वे क्या सोचते हैं?

   (ब) अपशिष्ट और उसके उपयोग के बारे में उनका क्या विचार है?

   (स) अपने परिणामों का समुच्चित चित्र (collage) तैयार करें।

मानव जीवन की गुणवत्ता और विश्व शांति बनाए रखने के लिए संसाधनों का समाज में न्यायसंगत बँटवारा आवश्यक हो गया है। यदि कुछ ही व्यक्तियों तथा देशों द्वारा संसाधनों का वर्तमान दोहन जारी रहता है, तो हमारी पृथ्वी का भविष्य खतरे में पड़ सकता है।

इसलिए, हर तरह के जीवन का अस्तित्व बनाए रखने के लिए संसाधनों के उपयोग की योजना बनाना अति आवश्यक है। सतत् अस्तित्व सही अर्थ में सतत् पोषणीय विकास का ही एक हिस्सा है।

सतत् पोषणीय विकास

सतत् पोषणीय आर्थिक विकास का अर्थ है कि विकास पर्यावरण को बिना नुकसान पहुँचाए हो और वर्तमान विकास की प्रक्रिया भविष्य की पीढ़ियों की आवश्यकता की अवहेलना न करे।

रियो डी जेनेरो पृथ्वी सम्मेलन, 1992

जून, 1992 में 100 से भी अधिक राष्ट्राध्यक्ष ब्राजील के शहर रियो डी जेनेरो में प्रथम अंतर्राष्ट्रीय पृथ्वी सम्मेलन में एकत्रित हुए। सम्मेलन का आयोजन विश्व स्तर पर उभरते पर्यावरण संरक्षण और सामाजिक-आर्थिक विकास की समस्याओं का हल ढूँढ़ने के लिए किया गया था। इस सम्मेलन में एकत्रित नेताओं ने भूमंडलीय जलवायु परिवर्तन और जैविक विविधता पर एक घोषणा पत्र पर हस्ताक्षर किया। रियो सम्मेलन में भूमंडलीय वन सिद्धांतों (Forest Principles) पर सहमति जताई और 21वीं शताब्दी में सतत् पोषणीय विकास के लिए एजेंडा 21 को स्वीकृति प्रदान की।

एजेंडा 21

यह एक घोषणा है जिसे 1992 में ब्राजील के शहर रियो डी जेनेरो में संयुक्त राष्ट्र पर्यावरण और विकास सम्मेलन (UNCED) के तत्वाधान में राष्ट्राध्यक्षों द्वारा स्वीकृत किया गया था। इसका उद्देश्य भूमंडलीय सतत् पोषणीय विकास हासिल करना है। यह एक कार्यसूची है जिसका उद्देश्य समान हितों, पारस्परिक आवश्यकताओं एवं सम्मिलित जिम्मेदारियों के अनुसार विश्व सहयोग के द्वारा पर्यावरणीय क्षति, गरीबी और रोगों से निपटना है। एजेंडा 21 का मुख्य उद्देश्य यह है कि प्रत्येक स्थानीय निकाय अपना स्थानीय एजेंडा 21 तैयार करे।

संसाधन नियोजन

संसाधनों के विवेकपूर्ण उपयोग के लिए नियोजन एक सर्वमान्य रणनीति है। इसलिए भारत जैसे देश में जहाँ संसाधनों की उपलब्धता में बहुत अधिक विविधता है, यह और भी महत्त्वपूर्ण है। यहाँ ऐसे प्रदेश भी हैं जहाँ एक तरह के संसाधनों की प्रचुरता है, परंतु दूसरे तरह के संसाधनों की कमी है। कुछ ऐसे प्रदेश भी हैं जो संसाधनों की उपलब्धता के संदर्भ में आत्मनिर्भर हैं और कुछ ऐसे भी प्रदेश हैं जहाँ महत्त्वपूर्ण संसाधनों की अत्यधिक कमी है। उदाहरणार्थ, झारखंड, मध्यप्रदेश और छत्तीसगढ़, आदि प्रांतों में खनिजों और कोयले के प्रचुर भंडार हैं। अरुणाचल प्रदेश में जल संसाधन प्रचुर मात्रा में पाए जाते हैं, परंतु मूल विकास की कमी है। राजस्थान में पवन और सौर ऊर्जा संसाधनों की बहुतायत है, लेकिन जल संसाधनों की कमी है। लद्दाख का शीत मरुस्थल देश के अन्य भागों से अलग-थलग पड़ता है। यह प्रदेश सांस्कृतिक विरासत का धनी है परंतु यहाँ जल, आधारभूत अवसंरचना तथा कुछ महत्त्वपूर्ण खनिजों की कमी है। इसलिए राष्ट्रीय, प्रांतीय, प्रादेशिक और स्थानीय स्तर पर संतुलित संसाधन नियोजन की आवश्यकता है।

क्रियाकलाप

अपने राज्य में पाए जाने वाले संसाधनों की सूची तैयार करें और जिन महत्त्वपूर्ण संसाधनों की आपके राज्य में कमी है, उनकी पहचान करें।

भारत में संसाधन नियोजन

संसाधन नियोजन एक जटिल प्रक्रिया है, जिसमें निम्नलिखित सोपान हैं — (क) देश के विभिन्न प्रदेशों में संसाधनों की पहचान कर उनकी तालिका बनाना। इस कार्य में क्षेत्रीय सर्वेक्षण, मानचित्र बनाना और संसाधनों का गुणात्मक एवं मात्रात्मक अनुमान लगाना व मापन करना है। (ख) संसाधन विकास योजनाएँ लागू करने के लिए उपयुक्त प्रौद्योगिकी, कौशल और संस्थागत नियोजन ढाँचा तैयार करना। (ग) संसाधन विकास योजनाओं और राष्ट्रीय विकास योजना में समन्वय स्थापित करना।

स्वाधीनता के बाद भारत में संसाधन नियोजन के उद्देश्य की पूर्ति के लिए प्रथम पंचवर्षीय योजना से ही प्रयास किए गए।

ज्ञात करो

समुदाय भागीदारी की सहायता से समुदाय/ग्राम पंचायत/वार्ड स्तरीय समुदायों द्वारा आपके आसपास के क्षेत्र में कौन से संसाधन विकसित किए जा रहे हैं?

किसी क्षेत्र के विकास के लिए संसाधनों की उपलब्धता एक आवश्यक शर्त है। परंतु प्रौद्योगिकी और संस्थाओं में तदनुरूपी परिवर्तनों के अभाव में मात्र संसाधनों की उपलब्धता से ही विकास संभव नहीं है। देश में बहुत से क्षेत्र हैं जो संसाधन समृद्ध होते हुए भी आर्थिक रूप से पिछड़े प्रदेशों की गिनती में आते हैं। इसके विपरीत कुछ ऐसे प्रदेश भी हैं जो संसाधनों की कमी होते हुए भी आर्थिक रूप से विकसित हैं।

क्या आप संसाधन संपन्न परंतु आर्थिक रूप से पिछड़े और संसाधन विहीन परंतु आर्थिक रूप से विकसित प्रदेशों के नाम बता सकते हैं? ऐसी परिस्थिति होने के कारण बताएँ।

उपनिवेशन का इतिहास हमें बताता है कि उपनिवेशों में संसाधन संपन्न प्रदेश, विदेशी आक्रमण कारियों के लिए मुख्य आकर्षण रहे हैं। उपनिवेशकारी देशों ने बेहतर प्रौद्योगिकी के सहारे उपनिवेशों के संसाधनों का शोषण किया तथा उन पर अपना आधिपत्य स्थापित किया। अतः संसाधन किसी प्रदेश के विकास में तभी योगदान दे सकते हैं, जब वहाँ उपयुक्त प्रौद्योगिकी विकास और संस्थागत परिवर्तन किए जाएँ। उपनिवेशन के विभिन्न चरणों में भारत ने इन सबका अनुभव किया है। अतः भारत में विकास सामान्यतः तथा संसाधन विकास लोगों के मुख्यतः संसाधनों की उपलब्धता पर ही आधारित नहीं था बल्कि इसमें प्रौद्योगिकी, मानव संसाधन की गुणवत्ता और ऐतिहासिक अनुभव का भी योगदान रहा है।

संसाधनों का संरक्षण – संसाधन किसी भी तरह के विकास में महत्त्वपूर्ण भूमिका निभाते हैं। परंतु संसाधनों का विवेकहीन उपभोग और अति उपयोग के कारण कई सामाजिक-आर्थिक और पर्यावरणीय समस्याएँ पैदा हो सकती हैं। इन समस्याओं से बचाव के लिए विभिन्न स्तरों पर संसाधनों का संरक्षण आवश्यक है। भूतकाल से ही संसाधनों का संरक्षण बहुत से नेताओं और चिंतकों के लिए चिंता का विषय रहा है। उदाहरणार्थ, गांधी जी ने संसाधनों के संरक्षण पर अपनी चिंता इन शब्दों में व्यक्त की है - हमारे पास हर व्यक्ति की आवश्यकता पूर्ति के लिए बहुत कुछ है, लेकिन किसी के लालच की संतुष्टि के लिए नहीं। अर्थात् हमारे पास पेट भरने के लिए बहुत है लेकिन पेटी भरने

के लिए नहीं। उनके अनुसार विश्व स्तर पर संसाधन ह्रास के लिए लालची और स्वार्थी व्यक्ति तथा आधुनिक प्रौद्योगिकी की शोषणात्मक प्रवृत्ति जिम्मेदार है। वे अत्यधिक उत्पादन के विरुद्ध थे और इसके स्थान पर अधिक बड़े जनसमुदाय द्वारा उत्पादन के पक्षधर थे।
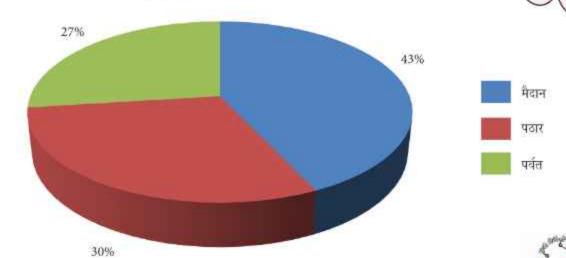
अंतर्राष्ट्रीय स्तर पर व्यवस्थित तरीके से संसाधन संरक्षण की वकालत 1968 में क्लब ऑफ रोम ने की। तत्पश्चात् 1974 में शुमेसर ने अपनी पुस्तक स्माल इज ब्यूटीफुल में इस विषय पर गांधी जी के दर्शन की एक बार फिर से पुनरावृत्ति की है। 1987 में ब्रुन्डलैंड आयोग रिपोर्ट द्वारा वैश्विक स्तर पर संसाधन संरक्षण में मूलाधार योगदान किया गया। इस रिपोर्ट ने सतत् पोषणीय विकास (Sustainable Development) की संकल्पना प्रस्तुत की और संसाधन संरक्षण की वकालत की। यह रिपोर्ट बाद में हमारा सांझा भविष्य (Our Common Future) शीर्षक से पुस्तक के रूप में प्रकाशित हुई। इस संदर्भ में एक और महत्त्वपूर्ण योगदान रियो डी जेनेरो, ब्राजील में 1992 में आयोजित पृथ्वी सम्मेलन द्वारा किया गया।
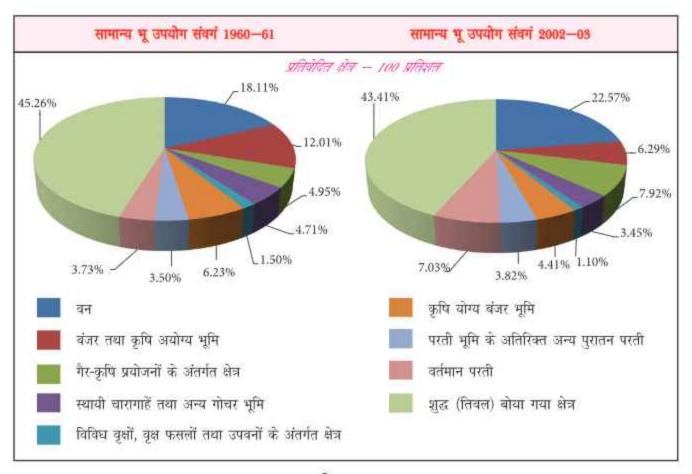
भू-संसाधन

हम भूमि पर रहते हैं, इसी पर अनेकों आर्थिक क्रियाकलाप करते हैं और विभिन्न रूपों में इसका उपयोग करते हैं। अतः भूमि एक बहुत महत्त्वपूर्ण प्राकृतिक संसाधन है। प्राकृतिक वनस्पति, वन्य जीवन, मानव जीवन, आर्थिक क्रियाएँ, परिवहन तथा संचार व्यवस्थाएँ भूमि पर ही आधारित हैं। परंतु भूमि एक सीमित संसाधन है, इसलिए उपलब्ध भूमि का विभिन्न उद्देश्यों के लिए उपयोग सावधानी और योजनाबद्ध तरीके से होना चाहिए।

भारत में भूमि पर विभिन्न प्रकार की भू-आकृतियाँ जैसे पर्वत, पठार, मैदान और द्वीप पाए जाते हैं। लगभग 43 प्रतिशत भू-क्षेत्र मैदान हैं जो कृषि और उद्योग के विकास के लिए सुविधाजनक हैं। पर्वत पूरे भू-क्षेत्र के 30 प्रतिशत भाग पर विस्तृत हैं। वे कुछ बारहमासी नदियों के प्रवाह को सुनिश्चित करते है, पर्यटन विकास के लिए अनुकूल परिस्थितियाँ प्रदान करता है और पारिस्थितिकी के लिए

पाठ में सम्मिलित सभी पाई चार्ट ऐसे बनाए जाएंगे कि जिससे उसके सभी भाग एक दूसरे के अलग प्रदर्शित हों। जिससे प्रत्येक भाग का विभेदीकरण सरलतापूर्वक किया जा सके।

चित्र 1.3 – मुख्य भू आकृतियों के अंतर्गत क्षेत्र

सामान्य भू उपयोग संवर्ग 1960–61   सामान्य भू उपयोग संवर्ग 2002–03

प्रतिवेदित क्षेत्र – 100 प्रतिशत

1960–61:
- 18.11%
- 45.26%
- 12.01%
- 4.95%
- 4.71%
- 1.50%
- 3.73%
- 3.50%
- 6.23%

2002–03:
- 43.41%
- 22.57%
- 6.29%
- 7.92%
- 3.45%
- 7.03%
- 3.82%
- 4.41%
- 1.10%

वन

बंजर तथा कृषि अयोग्य भूमि

गैर-कृषि प्रयोजनों के अंतर्गत क्षेत्र

स्थायी चारागाहें तथा अन्य गोचर भूमि

विविध वृक्षों, वृक्ष फसलों तथा उपवनों के अंतर्गत क्षेत्र

कृषि योग्य बंजर भूमि

परती भूमि के अतिरिक्त अन्य पुरातन परती

वर्तमान परती

शुद्ध (तिवल) बोया गया क्षेत्र

चित्र 1.4

महत्त्वपूर्ण है। देश के क्षेत्रफल का लगभग 27 प्रतिशत हिस्सा पठारी क्षेत्र है। इस क्षेत्र में खनिजों, जीवाश्म ईंधन और वनों का अपार संचय कोष है।

मुख्य भू आकृतियों के अन्तर्गत आने वाले क्षेत्रों को पाई चार्ट के माध्यम से दर्शाया जाएगा। यह क्षेत्र हैं – मैदान, पर्वत व पठार। इनके स्पष्टीकरण तथा विभेदीकरण के लिए मैदान वाले भाग पर थोड़ी मिट्टी का प्रयोग, पर्वत वाले भाग पर कार्क या प्लास्टर आफ पेरिस का प्रयोग कर पहाड़ की आकृति बनाई जाए तथा पठार वाले भाग को माचिस की डिब्बियों द्वारा बनाकर दर्शाया जाएगा।

भू-उपयोग

भू-संसाधनों का उपयोग निम्नलिखित उद्देश्यों से किया जाता है—

1. वन

2. कृषि के लिए अनुपलब्ध भूमि

     (अ) बंजर तथा कृषि अयोग्य भूमि

     (ब) गैर-कृषि प्रयोजनों में लगाई गई भूमि - जैसे इमारतें, सड़क, उद्योग इत्यादि।

3. परती भूमि के अतिरिक्त अन्य कृषि अयोग्य भूमि

   (अ) स्थायी चरागाहें तथा अन्य गोचर भूमि

   (ब) विविध वृक्षों, वृक्ष फसलों, तथा उपवनों के अधीन भूमि (जो शुद्ध बोए गए क्षेत्र में शामिल नहीं है)

   (स) कृषि योग्य बंजर भूमि जहाँ पाँच से अधिक वर्षों से खेती न की गई हो।

4. परती भूमि

   (अ) वर्तमान परती (जहाँ एक कृषि वर्ष या उससे कम समय से खेती न की गई हो)

   (ब) वर्तमान परती भूमि के अतिरिक्त अन्य परती भूमि या पुरातन परती (जहाँ 1 से 5 कृषि वर्ष से खेती न की गई हो)

5. शुद्ध (निवल) बोया गया क्षेत्र

   एक कृषि वर्ष में एक बार से अधिक बोए गए क्षेत्र को शुद्ध (निवल) बोए गए क्षेत्र में जोड़ दिया जाए तो वह सकल कृषित क्षेत्र कहलाता है।

भारत में भू-उपयोग प्रारूप

भू-उपयोग को निर्धारित करने वाले तत्त्वों में भौतिक कारक जैसे भू-आकृति, जलवायु और मृदा के प्रकार तथा मानवीय कारक जैसे जनसंख्या घनत्व, प्रौद्योगिक क्षमता, संस्कृति और परंपराएँ इत्यादि शामिल हैं।

भारत का कुल भौगोलिक क्षेत्रफल 32.8 लाख वर्ग किमी. है। परंतु इसके 93 प्रतिशत भाग के ही भू-उपयोग आँकड़े उपलब्ध हैं क्योंकि पूर्वोत्तर प्रांतों में असम को छोड़कर अन्य प्रांतों के सूचित क्षेत्र के बारे में जानकारी उपलब्ध नहीं है। इसके अलावा जम्मू और कश्मीर में पाकिस्तान और चीन अधिकृत क्षेत्रों के भूमि उपयोग का सर्वेक्षण भी नहीं हुआ है।

क्रियाकलाप

भू-उपयोग के दो वृत्त चित्रों 1.4 की तुलना करके पता लगाएँ कि 1960-61 और 2002-03 के बीच शुद्ध (निवल) बोये गये क्षेत्र और वनों के अंतर्गत भूमि में बहुत सीमित परिवर्तन ही क्यों आया है?

स्थायी चरागाहों के अंतर्गत भी भूमि कम हुई है। पशुधन की इतनी बड़ी संख्या के लिए चारा उपलब्ध कराने में कैसे समर्थ होंगे? और इसके क्या परिणाम होंगे? वर्तमान परती भूमि के अतिरिक्त अन्य परती भूमि अनुपजाऊ हैं और इन पर फसलें उगाने के लिए कृषि लागत बहुत ज्यादा है। अतः इस
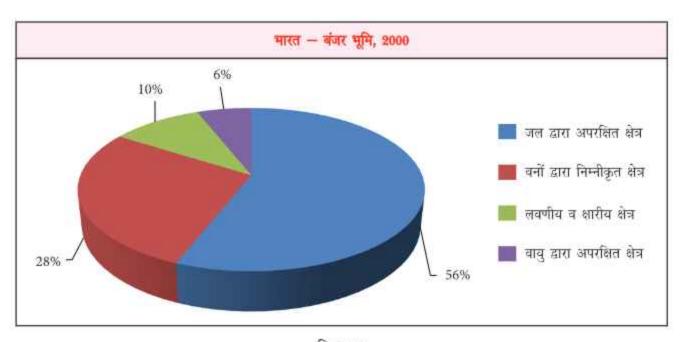
भूमि में दो या तीन वर्षों में इनको एक या दो बार बोया जाता है और यदि इसे शुद्ध (निवल) बोये गए क्षेत्र में शामिल कर लिया जाता है तब भी भारत के कुल सूचित क्षेत्र के लगभग 54 प्रतिशत हिस्से पर ही खेती हो सकती है।

शुद्ध (निवल) बोये गए क्षेत्र का प्रतिशत भी विभिन्न राज्यों में भिन्न-भिन्न है। पंजाब और हरियाणा में 80 प्रतिशत भूमि पर खेती होती है, परंतु अरुणाचल प्रदेश, मिजोरम, मणिपुर और अंडमान निकोबार द्वीप समूह में 10 प्रतिशत से भी कम क्षेत्र बोया जाता है।

इन राज्यों में शुद्ध (निवल) बोये गए क्षेत्र के कम अनुपात के लिए उत्तरदायी कारणों को ज्ञात कीजिए।

हमारे देश में राष्ट्रीय वन नीति (1952) द्वारा निर्धारित वनों के अंतर्गत 33 प्रतिशत भौगोलिक क्षेत्र वांछित हैं। जिसकी तुलना में वन के अंतर्गत क्षेत्र काफी कम है। वन नीति द्वारा निर्धारित यह सीमा पारिस्थितिकी संतुलन बनाए रखने के लिए आवश्यक है। वन क्षेत्रों के आस पास रहने वाले लाखों लोगों की आजीविका इस पर निर्भर करती है। भू-उपयोग का एक भाग बंजर भूमि और दूसरा गैर-कृषि प्रयोजनों में लगाई गई भूमि कहलाता है। बंजर भूमि में पहाड़ी चट्टानें, सूखी और मरुस्थलीय भूमि शामिल हैं। गैर-कृषि प्रयोजनों में लगाई भूमि में बस्तियाँ, सड़कें, रेल लाइन, उद्योग इत्यादि आते हैं। लंबे समय तक लगातार भूमि संरक्षण और प्रबंधन की अवहेलना करने एवं लगातार भू-उपयोग के कारण भू-संसाधनों का निम्नीकरण हो रहा है। इसके कारण समाज और पर्यावरण पर गंभीर आपदा आ सकती है।

चित्र 1.5

भूमि निम्नीकरण और संरक्षण उपाय

भूमि एक ऐसा संसाधन है जिसका उपयोग हमारे पूर्वज करते आए हैं तथा भावी पीढ़ी भी इसी भूमि का उपयोग करेगी। हम भोजन, मकान और कपड़े की अपनी मूल आवश्यकताओं का 95 प्रतिशत भाग भूमि से प्राप्त करते हैं। मानव कार्यकलापों के कारण न केवल भूमि का निम्नीकरण हो रहा है बल्कि भूमि को नुकसान पहुँचाने वाली प्राकृतिक ताकतों को भी बल मिला है। इस समय भारत में लगभग 13 करोड़ हेक्टेयर भूमि निम्नीकृत है। इसमें से लगभग 28 प्रतिशत भूमि निम्नीकृत वनों के अंतर्गत है, 56 प्रतिशत क्षेत्र जल अपरदित है और शेष क्षेत्र लवणीय और क्षारीय है। कुछ मानव क्रियाओं जैसे वनोन्मूलन, अति पशुचारण, खनन ने भी भूमि के निम्नीकरण में मुख्य भूमिका निभाई है।

खनन के उपरांत खदानों वाले स्थानों को गहरी खाइयों और मलबे के साथ खुला छोड़ दिया जाता है। खनन के कारण झारखंड, छत्तीसगढ़, मध्य प्रदेश और उड़ीसा जैसे राज्यों में वनोन्मूलन भूमि निम्नीकरण का कारण बना है। गुजरात, राजस्थान, मध्य प्रदेश और महाराष्ट्र में अति पशुचारण भूमि निम्नीकरण का मुख्य कारण है। पंजाब, हरिया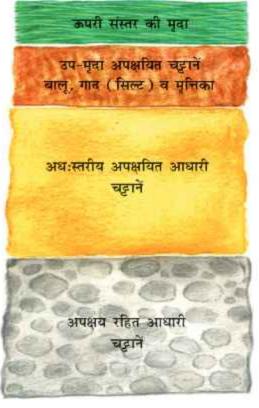णा और पश्चिमी उत्तर प्रदेश जैसे राज्यों में अधिक सिंचाई भूमि निम्नीकरण के लिए उत्तरदायी है। अति सिंचन से उत्पन्न जलाक्रांतता भी भूमि निम्नीकरण के लिए उत्तरदायी है जिससे मृदा में लवणीयता और क्षारीयता बढ़ जाती है। खनिज प्रक्रियाएँ जैसे सीमेंट उद्योग में चूना पत्थर को पीसना और मृदा बर्तन उद्योग में चूने (खड़िया मृदा) और सेलखड़ी के प्रयोग से बहुत अधिक मात्रा में वायुमंडल में धूल विसर्जित होती है। जब इसकी परत भूमि पर जम जाती है तो मृदा की जल सोखने की प्रक्रिया अवरुद्ध हो जाती है। पिछले कुछ वर्षों से देश के विभिन्न भागों में औद्योगिक जल निकास से बाहर आने वाला अपशिष्ट पदार्थ भूमि और जल प्रदूषण का मुख्य स्रोत है।

भूमि निम्नीकरण की समस्याओं को सुलझाने के कई तरीके हैं। वनारोपण और चरागाहों का उचित प्रबंधन इसमें कुछ हद तक मदद कर सकते हैं। पेड़ों की रक्षक मेखला (shelter belt), पशुचारण नियंत्रण और रेतीले टीलों को काँटेदार झाड़ियाँ लगाकर स्थिर बनाने की प्रक्रिया से भी भूमि कटाव की रोकथाम की जा सकती है। बंजर भूमि के उचित प्रबंधन, खनन नियंत्रण और औद्योगिक जल को परिष्करण के पश्चात् विसर्जित करके जल और भूमि प्रदूषण को कम किया जा सकता है।

कूपरी संस्तर की मृदा

उप-मृदा अपक्षयित चट्टानें बालू, गाद (सिल्ट) व मृत्तिका

अधःस्तरीय अपक्षयित आधारी चट्टानें

अपक्षय रहित आधारी चट्टानें
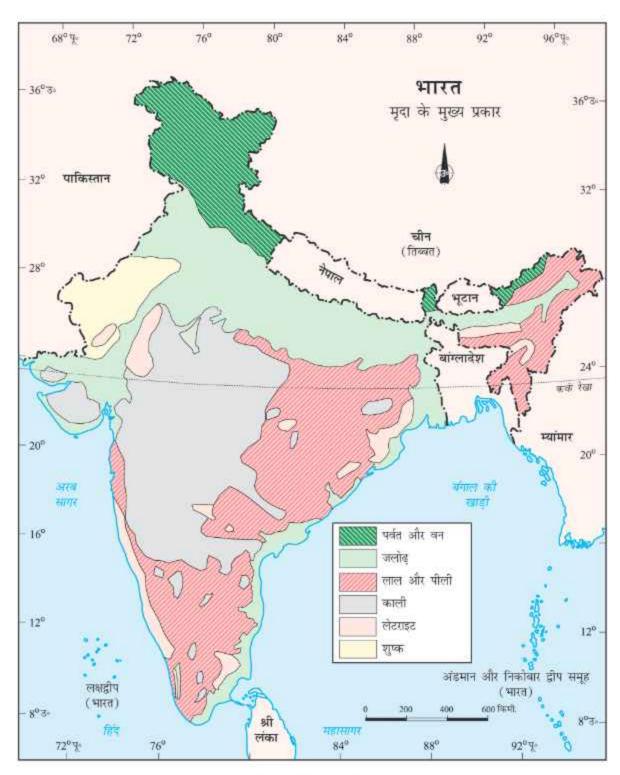
चित्र 1.6 – मृदा परिच्छेदिका

मृदा संसाधन

मिट्टी अथवा मृदा सबसे महत्त्वपूर्ण नवीकरण योग्य प्राकृतिक संसाधन है। यह पौधों के विकास का माध्यम है जो पृथ्वी पर विभिन्न प्रकार के जीवों का पोषण करती है। मृदा एक जीवंत तंत्र है। कुछ सेंटीमीटर गहरी मृदा बनने में लाखों वर्ष लग जाते हैं। मृदा बनने की प्रक्रिया में उच्चावच, जनक शैल अथवा संस्तर शैल, जलवायु, वनस्पति

भारत
मृदा के मुख्य प्रकार

पाकिस्तान

चीन
(तिब्बत)

नेपाल

भूटान

बांग्लादेश

म्यांमार

अरब
सागर

बंगाल की
खाड़ी

कर्क रेखा

	पर्वत और वन
	जलोढ़
	लाल और पीली
	काली
	लेटराइट
	शुष्क

लक्षद्वीप
(भारत)

श्री
लंका

हिंद
महासागर

अंडमान और निकोबार द्वीप समूह
(भारत)

0   200   400   600 किमी.

भारत – मृदा के मुख्य प्रकार

भारत में मृदा के विभिन्न प्रकारों को समझाने के लिए उपरोक्त वर्णित मानचित्र को
उभरा हुआ (tactile) बनाकर प्रदर्शित किया जाए।

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और अन्य जैव पदार्थ और समय मुख्य कारक हैं। प्रकृति के अनेकों तत्त्व जैसे तापमान परिवर्तन, बहते जल की क्रिया, पवन, हिमनदी और अपघटन क्रियाएँ आदि मृदा बनने की प्रक्रिया में योगदान देती हैं। मृदा में होने वाले रासायनिक और जैविक परिवर्तन भी महत्त्वपूर्ण हैं। मृदा जैव (ह्यूमस) और अजैव दोनों प्रकार के पदार्थों से बनती है।

मृदा बनने की प्रक्रिया को निर्धारित करने वाले तत्त्वों, उनके रंग, गहराई, गठन, आयु, व रासायनिक और भौतिक गुणों के आधार पर भारत की मृदाओं को निम्नलिखित प्रकारों में बाँटा जा सकता है।
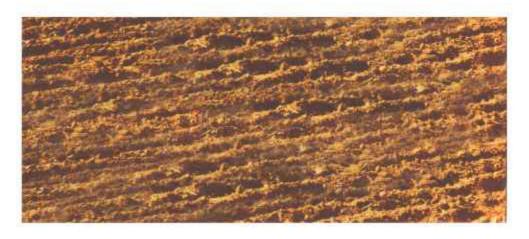

क्रियाकलाप

मृदा के मुख्य प्रकार मानचित्र पर दर्शने के लिए मानचित्र को किनारों से धागे, ऊन या पतली रस्सीयों उठारा जाएगा तथा अन्दर के भागों को दर्शने के लिए विभिन्न प्रकार की वस्तुओं जैसे छोटे मोती, दालें, चावल, इत्यादि का प्रयोग किया जाएगा।

मृदाओं का वर्गीकरण

भारत में अनेक प्रकार के उच्चावच, भू-आकृतियाँ, जलवायु और वनस्पतियाँ पाई जाती हैं। इस कारण अनेक प्रकार की मृदाएँ विकसित हुई हैं।

जलोढ़ मृदा

यह मृदा विस्तृत रूप से फैली हुई है और यह देश की महत्त्वपूर्ण मृदा है। वास्तव में संपूर्ण उत्तरी मैदान जलोढ़ मृदा से बना है। यह मृदाएँ हिमालय की तीन महत्त्वपूर्ण नदी तंत्रों सिंधु, गंगा और ब्रह्मपुत्र नदियों द्वारा लाए गए निक्षेपों से बनी हैं। एक सँकरे गलियारे के द्वारा ये मृदाएँ राजस्थान और गुजरात तक पैफली हैं। पूर्वी तटीय मैदान, विशेषकर महानदी, गोदावरी, कृष्णा और कावेरी नदियों के डेल्टे भी जलोढ़ मृदा से बने हैं।

चित्र 1.7 – जलोढ़ मृदा

जलोढ़ मृदा में रेत, सिल्ट और मृत्तिका के विभिन्न अनुपात पाए जाते हैं। जैसे हम नदी के मुहाने से घाटी में ऊपर की ओर जाते हैं मृदा के कणों का आकार बढ़ता चला जाता है। नदी घाटी के ऊपरी भाग में, जैसे ढाल भंग के समीप मोटे कण वाली मृदाएँ पाई जाती हैं। ऐसी मृदाएँ पर्वतों की तलहटी पर बने मैदानों जैसे द्वार, 'चो' क्षेत्र और तराई में आमतौर पर पाई जाती हैं।

कणों के आकार या घटकों के अलावा मृदाओं की पहचान उनकी आयु से भी होती है। आयु के आधार पर जलोढ़ मृदाएँ दो प्रकार की हैं — पुराना जलोढ़ (बांगर) और नया जलोढ़ (खादर)। बांगर मृदा में 'कंकर' ग्रंथियों की मात्रा ज्यादा होती है। खादर मृदा में बांगर मृदा की तुलना में ज़्यादा महीन कण पाए जाते हैं।

जलोढ़ मृदाएँ बहुत उपजाऊ होती हैं। अधिकतर जलोढ़ मृदाएँ पोटाश, पफास्पफोरस और चूनायुक्त होती हैं जो इनको गन्ने, चावल, गेहूँ और अन्य अनाजों और दलहन फसलों की खेती के लिए उपयुक्त बनाती है। अधिक उपजाऊपन के कारण जलोढ़ मृदा वाले क्षेत्रों में गहन कृषि की जाती है और यहाँ जनसंख्या घनत्व भी अधिक है। सूखे क्षेत्रों की मृदाएँ अधिक क्षारीय होती हैं। इन मृदाओं का सही उपचार और सिंचाई करके इनकी पैदावार बढ़ाई जा सकती है।

काली मृदा

इन मृदाओं का रंग काला है और इन्हें 'रेगर' मृदाएँ भी कहा जाता है। काली मृदा कपास की खेती के लिए उचित समझी जाती है और काली कपास मृदा के नाम से भी जाना जाता है। यह माना जाता है कि जलवायु और जनक शैलों ने काली मृदा के बनने में महत्त्वपूर्ण योगदान दिया है। इस प्रकार की मृदाएँ दक्कन पठार (बेसाल्ट) क्षेत्र के उत्तर पश्चिमी भागों में पाई जाती हैं और लावा जनक शैलों से बनी है। ये मृदाएँ महाराष्ट्र, सौराष्ट्र, मालवा, मध्य प्रदेश और छत्तीसगढ़ के पठार पर पाई जाती हैं और दक्षिण पूर्वी दिशा में गोदावरी और कृष्णा नदियों की घाटियों तक फैली हैं।

चित्र 1.8 – काली मृदा

काली मृदा बहुत महीन कणों अर्थात् मृत्तिका से बनी है। इसकी नमी धारण करने की क्षमता बहुत होती है। इसके अलावा ये मृदाएँ कैल्शियम कार्बोनेट, मैगनीशियम, पोटाश और चूने जैसे पौष्टिक तत्त्वों से परिपूर्ण होती हैं। परंतु इनमें फास्फोरस की मात्रा कम होती है। गर्म और शुष्क मौसम में इन मृदाओं में गहरी दरारें पड़ जाती हैं जिससे इनमें अच्छी तरह वायु मिश्रण हो जाता है। गीली होने पर ये मृदाएँ चिपचिपी हो जाती है और इन को जोतना मुश्किल होता है। इसलिए, इसकी जुताई मानसून प्रारंभ होने की पहली बौछार से ही शुरू कर दी जाती है।

लाल और पीली मृदा

लाल मृदा दक्कन पठार के पूर्वी और दक्षिणी हिस्सों में रवेदार आग्नेय चट्टानों पर कम वर्षा वाले भागों में विकसित हुई है। लाल और पीली मृदाएँ उड़ीसा, छत्तीसगढ़, मध्य गंगा मैदान के दक्षिणी छोर पर और पश्चिमी घाट में पहाड़ी पद पर पाई जाती है। इन मृदाओं का लाल रंग रवेदार आग्नेय और रूपांतरित चट्टानों में लौह धातु के प्रसार के कारण होता है। इनका पीला रंग इनमें जलयोजन के कारण होता है।

लेटराइट मृदा

लेटराइट शब्द ग्रीक भाषा के शब्द लेटर (Later) से लिया गया है जिसका अर्थ है ईंट। लेटराइट मृदा उच्च तापमान और अत्यधिक वर्षा वाले क्षेत्रों में विकसित होती है। यह भारी वर्षा से अत्यधिक निक्षालन (leaching) का परिणाम है। इस मृदा में ह्यूमस की मात्रा कम पाई जाती है क्योंकि

चित्र 1.9 – लेटराइट मृदा

अत्यधिक तापमान के कारण जैविक पदार्थों को अपघटित करने वाले बैक्टीरिया नष्ट हो जाते हैं। लेटराइट मृदा पर अधिक मात्रा में खाद और रासायनिक उर्वरक डाल कर ही खेती की जा सकती है। ये मृदाएँ मुख्य तौर पर कर्नाटक, केरल, तमिलनाडु, मध्य प्रदेश और उड़ीसा तथा असम के पहाड़ी क्षेत्र में पाई जाती है। मृदा संरक्षण की उचित तकनीक अपना कर इन मृदाओं पर कर्नाटक, केरल और तमिलनाडु में चाय और कॉफी उगाई जाती हैं। तमिलनाडु, आंध्र प्रदेश और केरल की लाल लेटराइट मृदाएँ काजू की फसल के लिए अधिक उपयुक्त हैं।

मरुस्थली मृदा

मरुस्थली मृदाओं का रंग लाल और भूरा होता है। ये मृदाएँ आम तौर पर रेतीली और लवणीय होती हैं। कुछ क्षेत्रों में नमक की मात्रा इतनी अधिक है कि झीलों से जल वाष्पीकृत करके खाने का नमक भी बनाया जाता है। शुष्क जलवायु और उच्च तापमान के कारण जलवाष्पन दर अधिक है और मृदाओं में ह्यूमस और नमी की मात्रा कम होती है। मृदा की सतह के नीचे केल्शियम की मात्रा बढ़ती चली जाती है और नीचे की परतों में चूने के कंकर की सतह पाई जाती है। इसके कारण मृदा में जल अंतः स्यंदन (infiltration) अवरुद्ध हो जाता है। इस मृदा को सही तरीके से सिंचित करके कृषि योग्य बनाया जा सकता है, जैसा कि पश्चिमी राजस्थान में हो रहा है।

चित्र 1.10 – मरुस्थली मृदा

वन मृदा

ये मृदाएँ आमतौर पर पहाड़ी और पर्वतीय क्षेत्रों में पाई जाती हैं जहाँ पर्याप्त वर्षा-वन उपलब्ध हैं। इन मृदाओं के गठन में पर्वतीय पर्यावरण के अनुसार बदलाव आता है। नदी घाटियों में ये मृदाएँ

दोमट और सिल्टदार होती है परंतु ऊपरी ढालों पर इनका गठन मोटे कणों का होता है। हिमालय के हिमाच्छादित क्षेत्रों में इन मृदाओं का बहुत अपरदन होता है और ये अधिसिलिक (cidic) तथा ह्यूमस रहित होती हैं। नदी घाटियों के निचले क्षेत्रों, विशेषकर नदी सोपानों और जलोढ़ पंखों, आदि में ये मृदाएँ उपजाऊ होती हैं।
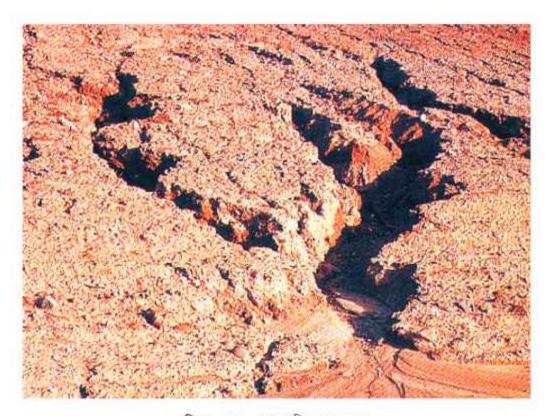
मृदा अपरदन और संरक्षण

मृदा के कटाव और उसके बहाव की प्रक्रिया को मृदा अपरदन कहा जाता है। मृदा के बनने और अपरदन की क्रियाएँ आमतौर पर साथ-साथ चलती है और दोनों में संतुलन होता है। परंतु मानवीय क्रियाओं जैसे वनोन्मूलन, अति पशुचारण, निर्माण और खनन इत्यादि से कई बार यह संतुलन भंग हो जाता है तथा प्राकृतिक तत्व जैसे पवन, हिमनदी और जल मृदा अपरदन करते हैं। बहता जल मृत्तिकायुक्त मृदाओं को काटते हुए गहरी वाहिकाएँ बनाता है, जिन्हें अवनलिकाएँ कहते हैं। ऐसी भूमि जोतने योग्य नहीं रहती और इसे उत्खात भूमि (bad land) कहते हैं। चंबल बेसिन में ऐसी भूमि को खड्ड (ravine) भूमि कहा जाता है। कई बार जल विस्तृत क्षेत्र को ढके हुए ढाल के साथ नीचे की ओर बहता है। ऐसी स्थिति में इस क्षेत्र की ऊपरी मृदा घुलकर जल के साथ बह जाती है। इसे चादर अपरदन (Sheet erosion) कहा जाता है। पवन द्वारा मैदान अथवा ढालू क्षेत्र से मृदा को उड़ा ले जाने की प्रक्रिया को पवन अपरदन कहा जाता है। कृषि के गलत तरीकों से भी मृदा अपरदन होता है। गलत ढंग से हल चलाने जैसे ढाल पर ऊपर से नीचे की ओर हल चलाने से वाहिकाएँ बन जाती हैं, जिसके अंदर से बहता पानी आसानी से मृदा का कटाव करता है।

चित्र 1.11 – मृदा अपरदन

ढाल वाली भूमि पर समोच्च रेखाओं के समानांतर हल चलाने से ढाल के साथ जल बहाव की गति घटती है। इसे समोच्च जुताई (contour ploughing) कहा जाता है। ढाल वाली भूमि पर सोपान बनाए जा सकते हैं। सोपान कृषि अपरदन को नियंत्रित करती है। पश्चिमी और मध्य हिमालय में सोपान अथवा सीढ़ीदार कृषि काफ़ी विकसित है। बड़े खेतों को पट्टियों में बाँटा जाता है। फसलों के बीच में घास की पट्टियाँ उगाई जाती हैं। ये पवनों द्वारा जनित बल को कमजोर करती हैं। इस तरीके को पट्टी कृषि (strip farming) कहते हैं। पेड़ों को कतारों में लगाकर रक्षक (shelter belt) मेखला बनाना भी पवनों की गति कम करता है। इन रक्षक पट्टियों का पश्चिम भारत में रेत के टीलों के स्थायीकरण में महत्त्वपूर्ण योगदान रहा है।
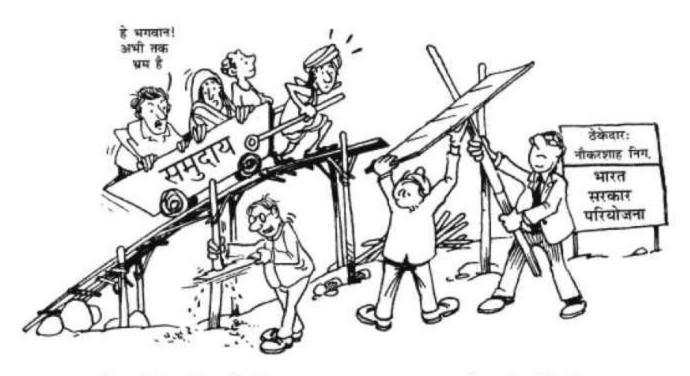
चित्र 1.12 – अवनालिका अपरदन

भारत के पर्यावरण की दशा

• सुखोमाजरी गाँव और झबुआ जिले ने यह कर दिखाया है कि भूमि निम्नीकरण प्रक्रिया को पलटा जा सकता है। सुखोमाजरी में वृक्ष घनत्व 1976 में 13 प्रति हेक्टेयर था जो कि 1992 में बढ़कर 1272 प्रति हेक्टेयर हो गया।

• पर्यावरण के पुनर्जनन से अधिक संसाधन उपलब्धता, कृषि और पशुपालन में सुधार के परिणामस्वरूप आमदनी बढ़ती है और समाज में आर्थिक समृद्धि आती है। सुखोमाजरी में 1979 से 1984 के बीच परिवारों की औसत वार्षिक आमदनी 10,000 से 15,000 रुपये थी।

- पर्यावरण की पुनर्स्थापना के लिए लोगों द्वारा इसका प्रबंधन आवश्यक है। मध्य प्रदेश सरकार ने लोगों को स्वयं फैसला लेने का अधिकार दिया है और वे प्रदेश की 29 लाख हेक्टेयर भूमि भारत का लगभग एक प्रतिशत क्षेत्रफल को जल विभाजक प्रबंधन द्वारा हरा-भरा बना रहे हैं।

स्रोत – सिटिजंस फिफ्थ रिपोर्ट, सेंटर फॉर साइंस एंड इनवायरनमेंट (सी एस ई) नई दिल्ली।

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Power-sharing

Pie charton Population distribution of Belegium

I have a simple equation in mind. Sharing power = dividing power = weakening the country. Why do we start by talking of this?

Overview

With this chapter, we resume the tour of democracy that we started last year. We noted last year that in a democracy all power does not rest with any one organ of the government. An intelligent sharing of power among legislature, executive and judiciary is very important to the design of a democracy. In this and the next two chapters, we carry this idea of power-sharing forward. We start with two stories from Belgium and Sri Lanka. Both these stories are about how democracies handle demands for power-sharing. The stories yield some general conclusions about the need for power-sharing in democracy. This allows us to discuss various forms of power-sharing that will be taken up in the following two chapters.

Belgium and Sri Lanka

Belgium is a small country in Europe, smaller in area than the state of Haryana. It has borders with France, the Netherlands, Germany and Luxembourg. It has a population of a little over one crore, about half the population of Haryana. The ETHNIC composition of this small country is very complex. Of the country's total population, 59 per cent lives in the Flemish region and speaks Dutch language. Another 40 per cent people live in the Wallonia region and speak French. Remaining one per cent of

the Belgians speak German. In the capital city Brussels, 80 per cent people speak French while 20 per cent are Dutchspeaking.

The minority French-speaking community was relatively rich and powerful. This was resented by the Dutch-speaking community who got the benefit of economic development and education much later. This led to tensions between the Dutch-speaking and French-speaking communities during the 1950s and 1960s. The tension between the two communities was more acute in Brussels. Brussels presented a special problem: the Dutch-speaking people constituted a majority in the country, but a minority in the capital.

Let us compare this to the situation in another country. Sri Lanka is an island nation, just a few kilometres off the southern coast of Tamil Nadu. It has about two crore people, about the same as in Haryana. Like other nations in the South Asia region, Sri Lanka has a diverse population. The major social groups are the Sinhala-speakers (74 per cent) and the Tamil-speakers (18 per cent). Among Tamils there are two subgroups. Tamil natives of the country are called 'Sri Lankan Tamils' (13 per cent). The rest, whose forefathers came from India as plantation workers during colonial period, are called 'Indian Tamils'. As you can see from the map, Sri Lankan Tamils are concentrated in the north and east of the country. Most of the Sinhalaspeaking people are Buddhists, while most of the Tamils are Hindus or Muslims. There are about 7 per cent Christians, who are both Tamil and Sinhala.
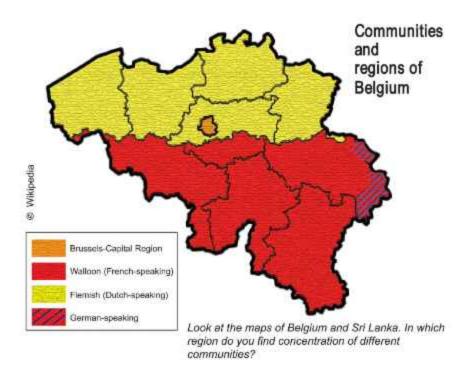
Table on Population distribution of MR

Pie charton Population distribution of Sri Lanka
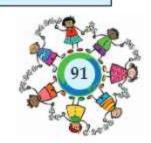
Brallie Note

Ethnic: A social division based on shared culture. People belonging to the same ethnic group believe in their common descent because of similarities of physical type or of culture or both. They need not always have the same religion or nationality

Coloured map with % of population a Thematic map unstinting group

Tactile Thematic map of communities and region of Belgium

Communities and regions of Belgium

© Wikipedia

- ■ Brussels-Capital Region
- ■ Walloon (French-speaking)
- ■ Flemish (Dutch-speaking)
- ▨ German-speaking

Look at the maps of Belgium and Sri Lanka. In which region do you find concentration of different communities?

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Just imagine what could happen in situations like this. In Belgium, the Dutch community could take advantage of its numeric majority and force its will on the French and German-speaking population. This would push the conflict among communities further. This could lead to a very messy partition of the country; both the sides would claim control over Brussels. In Sri Lanka, the Sinhala community enjoyed an even bigger majority and could impose its will on the entire country. Now, let us look at what happened in both these countries.
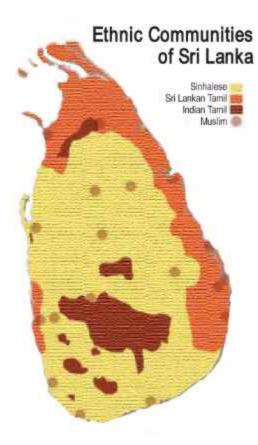
Majoritarianism in Sri Lanka

Sri Lanka emerged as an independent country in 1948. The leaders of the Sinhala community sought to secure dominance over government by virtue of their majority. As a result, the democratically elected government adopted a series of MAJORITARIAN measures to establish Sinhala supremacy.

In 1956, an Act was passed to recognise Sinhala as the only official language, thus disregarding Tamil. The governments followed preferential policies that favoured Sinhala applicants for university positions and government jobs. A new constitution stipulated that the state shall protect and foster Buddhism.

All these government measures, coming one after the other, gradually increased the feeling of alienation among the Sri Lankan Tamils. They felt that none of the major political parties led by the Buddhist Sinhala leaders was sensitive to their language and culture. They felt that the constitution and government policies denied them equal political rights, discriminated against them in getting jobs and other opportunities and ignored their interests. As a result, the relations between the Sinhala and Tamil communities strained over time.

The Sri Lankan Tamils launched parties and struggles for the recognition of Tamil as an official language, for regional autonomy and equality of opportunity in securing education

Toctile map of Ethnic Communities of Sri Lanka

Brallie Note

Majoritarianism: A belief that the majority community should be able to rule a country in whichever way it wants, by disregarding the Braille note wishes and needs of the minority.

Ethnic Communities of Sri Lanka

Sinhalese
Sri Lankan Tamil
Indian Tamil
Muslim

and jobs. But their demand for more autonomy to provinces populated by the Tamils was repeatedly denied. By 1980s several political organisations were formed demanding an independent Tamil Eelam (state) in northern and eastern parts of Sri Lanka.

The distrust between the two communities turned into widespread conflict. It soon turned into a CIVIL WAR. As a result thousands of people of both the communities have been killed. Many families were forced to leave the country as refugees and many more lost their livelihoods. You have read (Chapter 1 of Economics textbook, Class X) about Sri Lanka's excellent record of economic development, education and health. But the civil war has caused a terrible setback to the social, cultural and economic life of the country.

Accommodation in Belgium

The Belgian leaders took a different path. They recognised the existence of regional differences and cultural diversities. Between 1970 and 1993, they amended their constitution four times so as to work out an arrangement that would enable everyone to live together within the same country. The arrangement they worked out is different from any other country and is very innovative. Here are some of the elements of the Belgian model:

- Constitution prescribes that the number of Dutch and French-speaking ministers shall be equal in the central government. Some special laws require the support of majority of members from each linguistic group. Thus, no single community can make decisions unilaterally.

- Many powers of the central government have been given to state governments of the two regions of the country. The state governments are not subordinate to the Central Government.

- Brussels has a separate government in which both the communities have equal representation. The Frenchspeaking people accepted equal representation in Brussels because the Dutch-speaking community has accepted equal representation in the Central Government.

- Apart from the Central and the State Government, there is a third kind of government. This 'community government' is elected by people belonging to one language community – Dutch, French and German-speaking – no matter where they live. This government has the power regarding cultural, educational and language-related issues.

What's wrong if the majority community rules? If Sinhalas don't rule in Sri Lanka, where else will they rule?

Audio- Video documantry on Sri Lankan civil war. — Discovery

Brallie Note

Civil war: A violent conflict between opposing groups within a country that becomes so intense that it appears like a war.

The photograph here is of a street address in Belgium. You will notice that place names and directions in two languages – French and Dutch.

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What kind of a solution is this? I am glad our Constitution does not say which minister will come from which community.

You might find the Belgian model very complicated. It indeed is very complicated, even for people living in Belgium. But these arrangements have worked well so far. They helped to avoid civic strife between the two major communities and a possible division of the country on linguistic lines. When many countries of Europe came together to form the European Union, Brussels was chosen as its headquarters.

European Union Parliament in Belgium

Read any newspaper for one week and make clippings of news related to ongoing conflicts or wars. A group of five students could pool their clippings together and do the following:

- Classify these conflicts by their location (your state, India, outside India).

- Find out the cause of each of these conflicts. How many of these are related to power sharing disputes?

- Which of these conflicts could be resolved by working out power sharing arrangements?

What do we learn from these two stories of Belgium and Sri Lanka? Both are democracies. Yet, they dealt with the question of power sharing differently. In Belgium, the leaders have realised that the unity of the country is possible only by respecting the feelings and interests of different communities and regions. Such a realisation resulted in mutually acceptable arrangements for sharing power. Sri Lanka shows us a contrasting example. It shows us that if a majority community wants to force its dominance over others and refuses to share power, it can undermine the unity of the country.

> So you are saying that sharing of power makes us more powerful. Sounds odd! Let me think.

Why power sharing is desirable?

Thus, two different sets of reasons can be given in favour of power sharing. Firstly, power sharing is good because it helps to reduce the possibility of conflict between social groups. Since social conflict often leads to violence and political instability, power sharing is a good way to ensure the stability of political order. Imposing the will of majority community over others may look like an attractive option in the short run, but in the long run it undermines the unity of the nation. Tyranny of the majority is not just oppressive for the minority; it often brings ruin to the majority as well.

There is a second, deeper reason why power sharing is good for democracies. Power sharing is the very spirit of democracy. A democratic rule involves sharing power with those affected by its exercise, and who have to live with its effects. People have a right to be consulted on how they are to be governed. A legitimate government is one where citizens, through participation, acquire a stake in the system.

Let us call the first set of reasons PRUDENTIAL and the second moral. While prudential reasons stress that power sharing will bring out better outcomes, moral reasons emphasise the very act of power sharing as valuable.

The cartoon at the left refers to the problems of running the Germany's grand coalition government that includes the two major parties of the country, namely the Christian

FINE GERMAN ENGINEERING.

© Tab - The Calgary Sun, Cagle Cartoons Inc.

Praille discription of Picture

Democratic Union and the Social Democratic Party. The two parties are historically rivals to each other. They had to form a coalition government because neither of them got clear majority of seats on their own in the 2005 elections. They take divergent positions on several policy matters, but still jointly run the government.

> Annette studies in a Dutch medium school in the northern region of Belgium. Many French-speaking students in her school want the medium of instruction to be French. Selvi studies in a school in the northern region of Sri Lanka. All the students in her school are Tamil-speaking and they want the medium of instruction to be Tamil.
>
> • If the parents of Annette and Selvi were to approach respective governments to realise the desire of the child who is more likely to succeed? And why?

Khalil's dilemma

Brallie Note

Prudential: Based on prudence, or on careful calculation of gains and losses. Prudential decisions are usually contrasted with decisions based purely on moral considerations.

As usual, Vikram was driving the motorbike under a vow of silence and Vetal was the pillion rider. As usual, Vetal started telling Vikram a story to keep him awake while driving. This time the story went as follows:

"In the city of Beirut there lived a man called Khalil. His parents came from different communities. His father was an Orthodox Christian and mother a Sunni Muslim. This was not so uncommon in this modern, cosmopolitan city. People from various communities that lived in Lebanon came to live in its capital, Beirut. They lived together, intermingled, yet fought a bitter civil war among themselves. One of Khalil's uncles was killed in that war.

At the end of this civil war, Lebanon's leaders came together and agreed to some basic rules for power sharing among different communities. As per these rules, the country's President must belong to the Maronite sect of Catholic Christians. The Prime Minister must be from the Sunni Muslim community. The post of Deputy Prime Minister is fixed for Orthodox Christian sect and that of the Speaker for Shi'a Muslims. Under this pact, the Christians agreed not to seek French protection and the Muslims agreed not to seek unification with the neighbouring state of Syria. When the Christians and Muslims came to this agreement, they were nearly equal in population. Both sides have continued to respect this agreement though now the Muslims are in clear majority.

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Khalil does not like this system one bit. He is a popular man with political ambition. But under the present system the top position is out of his reach. He does not practise either his father's or his mother's religion and does not wish to be known by either. He cannot understand why Lebanon can't be like any other 'normal' democracy. "Just hold an election, allow everyone to contest and whoever wins maximum votes becomes the president, no matter which community he comes from. Why can't we do that, like in other democracies of the world?" he asks. His elders, who have seen the bloodshed of the civil war, tell him that the present system is the best guarantee for peace…"
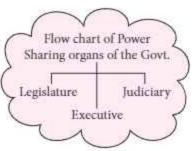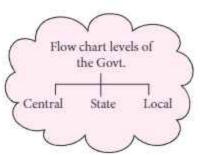
The story was not finished, but they had reached the TV tower where they stopped every day. Vetal wrapped up quickly and posed his customary question to Vikram: "If you had the power to rewrite the rules in Lebanon, what would you do? Would you adopt the 'regular' rules followed everywhere, as Khalil suggests? Or stick to the old rules? Or do something else?" Vetal did not forget to remind Vikram of their basic pact: "If you have an answer in mind and yet do not speak up, your mobike will freeze, and so will you!"

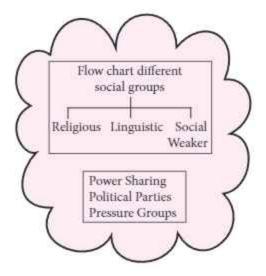**Can you help poor Vikram in answering Vetal?**

Forms of power-sharing

The idea of power-sharing has emerged in opposition to the notions of undivided political power. For a long time it was believed that all power of a government must reside in one person or group of persons located at one place. It was felt that if the power to decide is dispersed, it would not be possible to take quick decisions and to enforce them. But these notions have changed with the emergence of democracy. One basic principle of democracy is that people are the source of all political power. In a democracy, people rule themselves through institutions of self-government. In a good democratic government, due respect is given to diverse groups and views that exist in a society. Everyone has a voice in the shaping of public policies. Therefore, it follows that in a democracy political Forms of power-sharing power should be distributed among as many citizens as possible.

Flow chart of Power Sharing organs of the Govt.

Legislature | Judiciary
Executive

Flow chart levels of the Govt.

Central   State   Local

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Flow chart different social groups

Religious   Linguistic   Social Weaker

Power Sharing
Political Parties
Pressure Groups

Reigning Reins

© Olle Johansson - Sweden, Cagle Cartoons Inc.

WE GOTTA KEEP THE REIN TIGHT, VLADIMIR...

Recently some new laws were made in Russia giving more powers to its president. During the same time the US president visited Russia. What, according to this cartoon, is the relationship between democracy and concentration of power? Can you think of some other examples to illustrate the point being made here?

Brallie discription of the cartoon

In modern democracies, power sharing arrangements can take many forms. Let us look at some of the most common arrangements that we have or will come across.

1. Power is shared **among different organs of government**, such as the legislature, executive and judiciary. Let us call this horizontal distribution of power because it allows different organs of government placed at the same level to exercise different powers. Such a separation ensures that none of the organs can exercise unlimited power. Each organ checks the others. This results in a balance of power among various institutions. Last year, we studied that in a democracy, even though ministers and government officials exercise power, they are responsible to the Parliament or State Assemblies. Similarly, although judges are appointed by the executive, they can check the functioning of executive or laws made by the legislatures. This arrangement is called a system of checks and balances.

2. Power can be shared among governments at different levels – a general government for the entire country and governments at the provincial or regional level. Such a general government for the entire country is usually called federal government. In India, we refer to it as the Central or Union Government. The governments at the provincial or regional level are called by different names in different countries. In India, we call them State Governments. This system is not followed in all countries. There are many countries where there are no provincial or state governments. But in those countries like ours, where there are different levels of government, the constitution clearly lays down the powers of different levels of government. This is what they did in Belgium, but was refused in Sri Lanka. This is called federal division of power. The same principle can be extended to levels of government lower than the State government, such as the municipality and panchayat. Let us call division of powers involving higher and lower levels of government vertical division of power. We shall study these at some length in the next chapter.

3. Power may also be shared among different social groups such as the religious and linguistic groups. 'Community government' in Belgium is a good example of this arrangement. In some countries there are constitutional and legal arrangements whereby socially weaker sections and women are represented in the legislatures and administration. Last year, we studied the system of 'reserved constituencies' in assemblies and the parliament of our country. This type of arrangement is meant to give space in the government and administration to diverse social groups who otherwise would feel alienated from the government. This method is used to give minority communities a fair share in power. In Unit II, we shall look at various ways of accommodating social diversities.

4. Power sharing arrangements can also be seen in the way political parties, pressure groups and movements control or influence those in power. In a democracy, the citizens must have freedom to choose among various contenders for power. In contemporary democracies, this takes the form of competition among different parties. Such competition ensures that power does not remain in one hand. In the long run, power is shared among different political parties that represent different ideologies and social groups. Sometimes this kind of sharing can be direct, when two or more parties form an alliance to contest elections. If their alliance is elected, they form a coalition government and thus share power. In a democracy, we find interest groups such as those of traders, businessmen, industrialists, farmers

In my school, the class monitor changes every month. Is that what you call a power sharing arrangement?
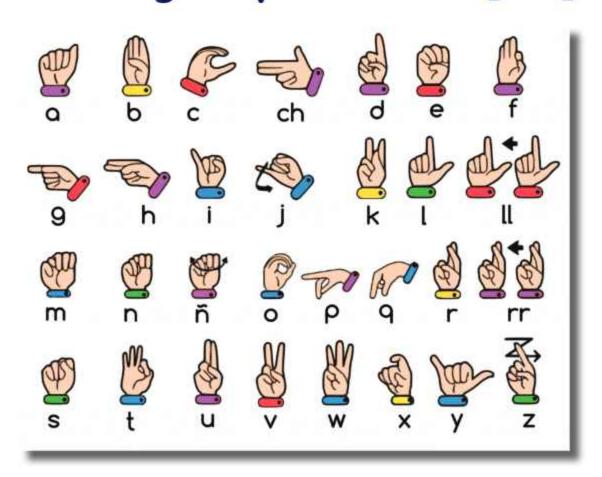
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and industrial workers. They also will have a share in governmental power, either through participation in governmental committees or bringing influence on the decision-making process. In Unit III, we shall study the working of political parties, pressure groups and social movements.

Here are some examples of power sharing. Which of the four types of power sharing do these represent? Who is sharing power with whom?
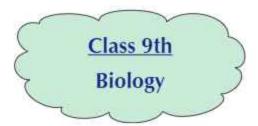
- The Bombay High Court ordered the Maharashtra state government to immediately take action and improve living conditions for the 2,000-odd children at seven children's homes in Mumbai.

- The government of Ontario state in Canada has agreed to a land claim settlement with the aboriginal community. The Minister responsible for Native Affairs announced that the government will work with aboriginal people in a spirit of mutual respect and cooperation.

- Russia's two influential political parties, the Union of Right Forces and the Liberal Yabloko Movement, agreed to unite their organisations into a strong right-wing coalition. They propose to have a common list of candidates in the next parliamentary elections.

- The finance ministers of various states in Nigeria got together and demanded that the federal government declare its sources of income. They also wanted to know the formula by which the revenue is distributed to various state governments.

Adaptation for Children with Hearing Impairement [HI]

Why Do We Fall ill

Group Activity (Project)

Divide the students in group and give a name of disease, teacher tell to collect the information from news papers, Magazines. Internet and other sources, also classify them.

Evaluation: Objective type Questions.

Q.1 Health is a state of _____ _____ being.

    (a) Physical, Mental

    (b) Social, Mental

    (c) Social, Physical

    (d) Physical, Mental and Social Well.

Q.2 The health of an individual is dependent on his/her _____

    (a) Physical surroundings

    (b) Economic status.

    (c) The kind of food he/she eats.

    (d) All of the above.

One word Answer type Questions:

Q.3 Write the name of two acute diseases.

Q.4 Write causes of some diseases.

Q.5 Match the following:

(1)	Bacterial Diseases	(a)	Common Cold
(2)	Protozoan Diseases	(b)	Typhoid
(3)	Fungal Diseases	(c)	Malaria
(4)	Viral Diseases	(d)	Skin diseases

Objectives

(i) The students should be able to differentiate between the words 'Health' and 'disease'.

(ii) The students will be able to understand the various diseases.

(iii) The students will be able to explain the different diseases.

(iv) The students will be able to classify the diseases.

(v) The students should be able to explain causes of different diseases.

Activity A

The teacher will show a picture of a hospital and following questions will be asked. Orally and write questions on blackboard.

(i) What is this picture about?

(ii) Why we go this place?

(iii) Some of you, Please share your experiences of visiting the place. (Involve HI Students)

Activity B

To take up the topic - Health .... Imp/Significance two sets of Flash cards.

First set of Flash card showing - healthy person doing different activities.

Second set of Flash Card showing - Unhealthy person doing different activities.

Discussion on the Blackboard by the teacher on "Healthy" and "Disease" Conclusion - health is important for daily life and its function.

Health	Disease
• Health is over all-society and communities • Good health means being comfortable	• Disease is individual • Disease means being uncomfortable.

Activity 13.1

- We have all heard of the earthquakes in Latur, Bhuj, Kashmir etc. or the cyclones that attack the coastal regions. Think of as many different ways as possible in which people's health would be affected by such a disaster if it took place in our neighbourhood.

- How many of these ways we can think of are events that would occur when the disaster is actually happening?

- How many of these health-related events would happen long after the actual disaster, but would still be because of the disaster?

- Why would one effect on health fall into the first group, and why would another fall into the second group?

When we do this exercise, we realise that health and disease in human communities are very complex issues, with many interconnected causes. We also realise that the ideas of what 'health' and 'disease' mean are

themselves very complicated. When we ask what causes diseases and how we prevent them, we have to begin by asking what these notions mean.

We have seen that cells are the basic units of living beings. Cells are made of a variety of chemical substances – proteins, carbohydrates, fats or lipids, and so on. Although the pictures look quite static, in reality the living cell is a dynamic place. Something or the other is always happening. Cells move from place to place. Even in cells that do not move, there is repair going on. New cells are being made. In our organs or tissues, there are various specialised activities going on – the heart is beating, the lungs are breathing, the kidney is filtering urine, the brain is thinking.

All these activities are interconnected. For example, if the kidneys are not filtering urine, poisonous substances will accumulate. Under such conditions, the brain will not be able to think properly. For all these interconnected activities, energy and raw material are needed from outside the body. In other words, food is a necessity for cell and tissue functions. Anything that prevents proper functioning of cells and tissues will lead to a lack of proper activity of the body.

It is in this context that we will now look at the notions of health and disease.

13.1 Health and its Failure

13.1.1 The Significance of 'Health'

We have heard the word 'health' used quite frequently all around us. We use it ourselves as well, when we say things like 'my grandmother's health is not good'. Our teachers use it when they scold us saying 'this is not a healthy attitude'. What does the word 'health' mean?

If we think about it, we realise that it always implies the idea of 'being well'. We can think of this well-being as effective functioning. For our grandmothers, being able to go out to the market or to visit neighbours is 'being well', and not being able to do such things is 'poor health'. Being interested in following the teaching in the classroom so that we can understand the world is called a 'healthy attitude'; while not being interested is called the opposite. 'Health' is therefore a state of being well enough to function well physically, mentally and socially.

13.1.2 Personal and Community Issues Both Matter for Health

If health means a state of physical, mental and social well-being, it cannot be something that each one of us can achieve entirely on our own. The health

of all organisms will depend on their surroundings or their environment. The environment includes the physical environment. So, for example, health is at risk in a cyclone in many ways.
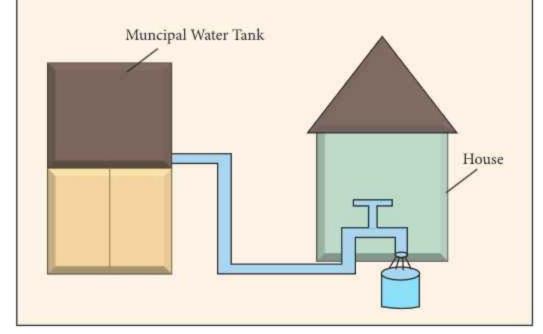
But even more importantly, human beings live in societies. Our social environment, therefore, is an important factor in our individual health. We live in villages, towns or cities. In such places, even our physical environment is decided by our social environment.

Consider what would happen if no agency is ensuring that garbage is collected and disposed. What would happen if no one takes responsibility for clearing the drains and ensuring that water does not collect in the streets or open spaces?

So, if there is a great deal of garbage thrown in our streets, or if there is open drainwater lying stagnant around where we live, the possibility of poor health increases. Therefore, public cleanliness is important for individual health.

Activity 13.2

- Find out what provisions are made by your local authority (panchayat/ municipal corporation) for the supply of clean drinking water.

- Are all the people in your locality able to access this?

Muncipal Water Tank

House

Activity 13.3

- Find out how your local authority manages the solid waste generated in your neighbourhood.

- Are these measures adequate?

- If not, what improvements would you suggest?

- What could your family do to reduce the amount of solid waste generated during a day/week?

We need food for health, and this food will have to be earned by doing work. For this, the opportunity to do work has to be available. Good economic conditions and jobs are therefore needed for individual health.

We need to be happy in order to be truly healthy, and if we mistreat each other and are afraid of each other, we cannot be happy or healthy. Social equality and harmony are therefore necessary for individual health. We can think of many other such examples of connections between community issues and individual health.

13.1.3 Distinctions between 'Healthy' and 'Disease-Free'

If this is what we mean by 'health', what do we mean by 'disease'? The word is actually self-explanatory – we can think of it as 'disease' – disturbed ease. Disease, in other words, literally means being uncomfortable. However, the word is used in a more limited meaning. We talk of disease when we can find a specific and particular cause for discomfort. This does not mean that we have to know the absolute final cause; we can say that someone

is suffering from diarrhoea without knowing exactly what has caused the loose motions.

We can now easily see that it is possible to be in poor health without actually suffering from a particular disease. Simply not being diseased is not the same as being healthy. 'Good health' for a dancer may mean being able to stretch his body into difficult but graceful positions. On the other hand, good health for a musician may mean having enough breathing capacity in his/her lungs to control the notes from his/her flute. To have the opportunity to realise the unique potential in all of us is also necessary for real health.

So, we can be in poor health without there being a simple cause in the form of an identifiable disease. This is the reason why, when we think about health, we think about societies and communities. On the other hand, when we think about disease, we think about individual sufferers.

QUESTIONS

1. State any two conditions essential for good health.
2. State any two conditions essential for being free of disease.
3. Are the answers to the above questions necessarily the same or different? Why?

13.2 Disease and Its Causes Disease and Its Causes

The teacher will show models/charts/pictures of following system

- Digestive system
- Musculoskeletal system
- Body Functions
- Organ system

the teacher will explain that, during any disease, these system might not function properly.

- The teacher will ask the students to conduct a role play on various disease.

- Prepare students in advance .... pair up the students as one doctor and one patient.

1st the students to do role play on the following

    (i)   Stomach infection - Description of symptom

    (ii) Throat Infection - Description of symptom

    (ii) T-B, Typhoid

    (iv) Elephantesis

After the role play the teacher will take the following discussion and then ask students to come on board and write the names of the diseases.

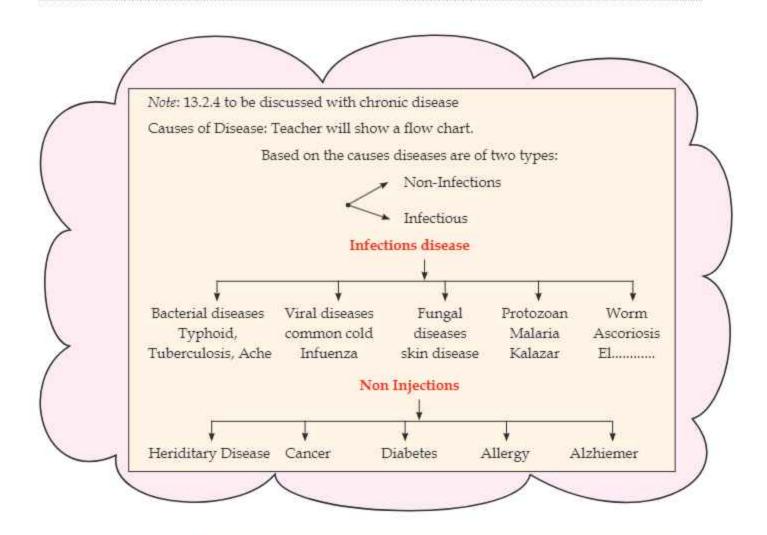## 13.2.1 What Does Disease Look Like?

Let us now think a little more about diseases. In the first place, how do we know that there is a disease? In other words, how do we know that there is something wrong with the body? There are many tissues in the body, as we have seen in Chapter 6.

These tissues make up physiological systems or organ systems that carry out body functions. Each of the organ systems has specific organs as its parts, and it has particular functions. So, the digestive system has the stomach and intestines, and it helps to digest food taken in from outside the body. The musculoskeletal system, which is made up of bones and muscles, holds the body parts together and helps the body move.

When there is a disease, either the functioning or the appearance of one or more systems of the body will change for the worse. These changes give rise to symptoms and signs of disease. Symptoms of disease are the things we feel as being 'wrong'. So we have a headache, we have cough, we have loose motions, we have a wound with pus; these are all symptoms. These indicate that there may be a disease, but they don't indicate what the disease is. For example, a headache may mean just examination stress or, very rarely, it may mean meningitis, or any one of a dozen different diseases.

Signs of disease are what physicians will look for on the basis of the symptoms. Signs will give a little more definite indication of the presence of a particular disease. Physicians will also get laboratory tests done to pinpoint the disease further.

Note: 13.2.4 to be discussed with chronic disease

Causes of Disease: Teacher will show a flow chart.

Based on the causes diseases are of two types:

Non-Infections

Infectious

Infections disease

Bacterial diseases Typhoid, Tuberculosis, Ache	Viral diseases common cold Infuenza	Fungal diseases skin disease	Protozoan Malaria Kalazar	Worm Ascoriosis El............

Non Injections

Heriditary Disease	Cancer	Diabetes	Allergy	Alzhiemer

Teacher will carry out this activity with HI students with the help of picture flash cards of different diseases.

Activity 13.4

- Survey your neighbourhood to find out:

  (1) how many people suffered from acute diseases during the last three months,

  (2) how many people developed chronic diseases during this same period,

  (3) and finally, the total number of people suffering from chronic diseases in your neighbourhood.

- Are the answers to questions (1) and (2) different?

- Are the answers to questions (2) and (3) different?

- What do you think could be the reason for these differences? What do you think would be the effect of these differences on the general health of the population?
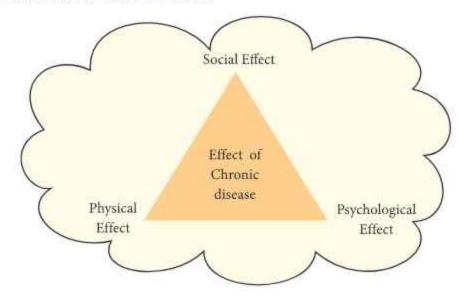
13.2.2 Acute and Chronic Diseases

The manifestations of disease will be different depending on a number of factors. One of the most obvious factors that determine how we perceive the disease is its duration. Some diseases last for only very short periods of time, and these are called acute diseases. We all know from experience that the common cold lasts only a few days. Other ailments can last for a long time, even as much as a lifetime, and are called chronic diseases. An example is the infection causing elephantiasis, which is very common in some parts of India.

Chart

Acute	Chronic
Disease that last for only very short periods.	Disease that last for a long time, even as much as a lifetime.

13.2.3 Chronic Diseases and Poor Health

As we can imagine, acute and chronic diseases have different effects on our health. Any disease that causes poor functioning of some part of the body will affect our general health as well. This is because all functions of the body are necessary for general health. But an acute disease, which is over very soon, will not have time to cause major effects on general health, while a chronic disease will do so.

Social Effect

Effect of Chronic disease

Physical Effect

Psychological Effect

As an example, think about a cough and cold, which all of us have from time to time. Most of us get better and become well within a week or so. And there are no bad effects on our health. We do not lose weight, we do not become short of breath, we do not feel tired all the time because of a few days of cough and cold. But if we get infected with a chronic disease such as tuberculosis of the lungs, then being ill over the years does make us lose weight and feel tired all the time.

We may not go to school for a few days if we have an acute disease. But a chronic disease will make it difficult for us to follow what is being taught in school and reduce our ability to learn. In other words, we are likely to have prolonged general poor health if we have a chronic disease. Chronic diseases therefore, have very drastic long-term effects on people's health as compared to acute diseases.

13.2.4 Causes of Diseases

What causes disease? When we think about causes of diseases, we must remember that there are many levels of such causes. Let us look at an example. If there is a baby suffering from loose motions, we can say that the cause of the loose motions is an infection with a virus. So the immediate cause of the disease is a virus.

But the next question is – where did the virus come from? Suppose we find that the virus came through unclean drinking water. But many babies must have had this unclean drinking water. So, why is it that one baby developed loose motions when the other babies did not?

One reason might be that this baby is not healthy. As a result, it might be more likely to have disease when exposed to risk, whereas healthier babies would not. Why is the baby not healthy? Perhaps because it is not well nourished and does not get enough food. So, lack of good nourishment becomes a secondlevel cause of the disease the baby is suffering from. Further, why is the baby not well nourished? Perhaps because it is from a household which is poor.

It is also possible that the baby has some genetic difference that makes it more likely to suffer from loose motions when exposed to such a virus. Without the virus, the genetic difference or the poor nourishment alone would not lead to loose motions. But they do become contributory causes of the disease.
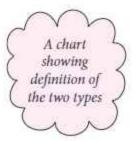
Why was there no clean drinking water for the baby? Perhaps because the public services are poor where the baby's family lives. So, poverty or lack of public services become third-level causes of the baby's disease.
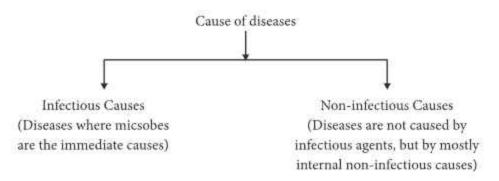
It will now be obvious that all diseases will have immediate causes and contributory causes. Also, most diseases will have many causes, rather than one single cause.

13.2.5 Infectious and Non-Infectious Causes

As we have seen, it is important to keep public health and community health factors in mind when we think about causes of diseases. We can take that approach a little further. It is useful to think of the immediate causes of disease as belonging to two distinct types. One group of causes is the infectious agents, mostly microbes or micro-organisms. Diseases where microbes are the immediate causes are called infectious diseases. This is because the microbes can spread in the community, and the diseases they cause will spread with them.

A chart showing definition of the two types

```
                    Cause of diseases
                          |
          _____|_____
         |                                 |
  Infectious Causes              Non-infectious Causes
 (Diseases where micsobes        (Diseases are not caused by
  are the immediate causes)       infectious agents, but by mostly
                                   internal non-infectious causes)
```

Things to Ponder

1. Do all diseases spread to people coming in contact with a sick person?

2. What are the diseases that are not spreading?

3. How would a person develop those diseases that don't spread by contact with a sick person?

On the other hand, there are also diseases that are not caused by infectious agents. Their causes vary, but they are not external causes like microbes that can spread in the community. Instead, these are mostly internal, non-infectious causes.

For example, some cancers are caused by genetic abnormalities. High blood pressure can be caused by excessive weight and lack of exercise. You can think of many other diseases where the immediate causes will not be infectious.

The ways in which diseases spread, and the ways in which they can be treated and prevented at the community level would be different for different diseases. This would depend a lot on whether the immediate causes are infectious or non-infectious.

Peptic ulcers and the Nobel Prize

For many years, everybody used to think that peptic ulcers, which cause acidity– related pain and bleeding in the stomach and duodenum, were because of lifestyle reasons. Everybody thought that a stressful life led to a lot of acid secretion in the stomach, and eventually caused peptic ulcers.

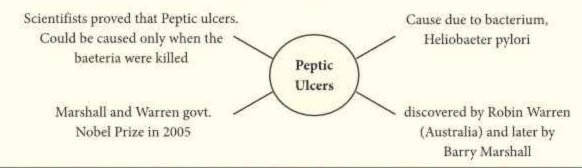Then two Australians made a discovery that a bacterium, Helicobacter pylori, was responsible for peptic ulcers. Robin Warren (born 1937), a pathologist from Perth, Australia, saw these small curved bacteria in the lower part of the stomach in many patients. He noticed that signs of inflammation were always present around these bacteria. Barry Marshall (born 1951), a young clinical fellow, became interested in Warren's findings and succeeded in cultivating the bacteria from these sources.

In treatment studies, Marshall and Warren showed that patients could be cured of peptic ulcer only when the bacteria were killed off from the stomach. Thanks to this pioneering discovery by Marshall and Warren, peptic ulcer disease is no longer a chronic, frequently disabling condition, but a disease that can be cured by a short period of treatment with antibiotics.

For this achievement, Marshall and Warren (seen in the picture) received the Nobel prize for physiology and medicine in 2005.

Peptic ulcers and Nobel Prize

Scientifists proved that Peptic ulcers. Could be caused only when the baeteria were killed

Cause due to bacterium, Heliobaeter pylori

Peptic Ulcers

Marshall and Warren govt. Nobel Prize in 2005

discovered by Robin Warren (Australia) and later by Barry Marshall

A diagram showing the information about Peptice class and noble prize will be shown by the teacher

QUESTIONS

1. List any three reasons why you would think that you are sick and ought to see a doctor. If only one of these symptoms were present, would you still go to the doctor?
   Why or why not?

2. In which of the following case do you think the long-term effects on your health are likely to be most unpleasant?
   - if you get jaundice,
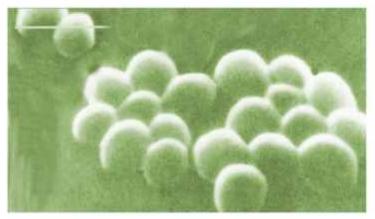   - if you get lice,
   - if you get acne.
   Why?

Figure 13.1(a): Picture of SARS viruses coming out (see arrows for examples) of the surface of an infected cell. The white scale line represents 500 nanometres, which is half a micrometre, which is onethousandth of a millimetre. The scale line gives us an idea of how small the things we are looking at are.

Courtesy: Emerging Infectious Deseases, a journal of CDC, U.S.

Figure 13.1(b): Picture of staphylococci, the bacteria which can cause acne. The scale of the image is indicated by the line at top left, which is 5 micrometres long.
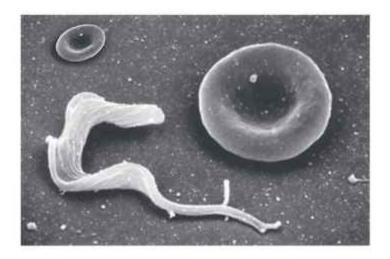
Figure 13.1(c): Picture of Trypanosoma, the protozoan organism responsible for sleeping sickness. The organism is lying next to a saucer-shaped red blood cell to give an idea of the scale.

Copyright: Oregon Health and Science University, U.S.

Figure 13.1(d): Picture of Leishmania, the protozoan organism that causes kala-azar. The organisms are oval-shaped, and each has one long whip-like structure. One organism (arrow) is dividing, while a cell of the immune system (lower right) has gripped on the two whips of the dividing organism and is sending cell processes up to eat up the organism. The immune cell is about ten micrometres in diameter.

Figure 13.1(e): Picture of an adult roundworm (Ascaris lumbricoides is the technical name) from the small intestine. The ruler next to it shows four centimetres to give us an idea of the scale.
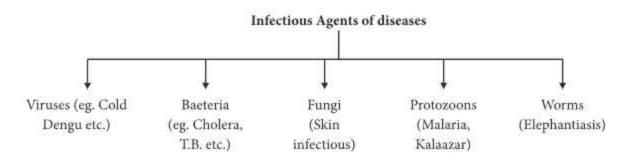
13.3 Infectious Diseases

13.3.1 Infectious Agents

We have seen that the entire diversity seen in the living world can be classified into a few groups. This classification is based on common characteristics between different organisms. Organisms that can cause disease are found in a wide range of such categories of classification. Some of them are viruses, some are bacteria, some are fungi, some are single-celled animals or protozoans. Some diseases are also caused by multicellular organisms, such as worms of different kinds.

Flowchart showing infections agents and their some examples will be shown to the students

Common examples of diseases caused by viruses are the common cold, influenza, dengue fever and AIDS. Diseases like typhoid fever, cholera, tuberculosis and anthrax are caused by bacteria. Many common skin infections are caused by different kinds of fungi. Protozoan microbes cause many familiar diseases, such as malaria and kalaazar. All of us have also come across intestinal worm infections, as well as diseases like elephantiasis caused by diffferent species of worms.

Infectious Agents of diseases

Viruses (eg. Cold Dengu etc.)	Baeteria (eg. Cholera, T.B. etc.)	Fungi (Skin infectious)	Protozoons (Malaria, Kalaazar)	Worms (Elephantiasis)

Why is it important that we think of these categories of infectious agents? The answer is that these categories are important factors in deciding what kind of treatment to use. Members of each one of these groups – viruses, bacteria, and so on – have many biological characteristics in common.

All viruses, for example, live inside host cells, whereas bacteria very rarely do. Viruses, bacteria and fungi multiply very quickly, while worms multiply very slowly in comparison. Taxonomically, all bacteria are closely related to each other than to viruses and vice versa. This means that many important life processes are similar in the bacteria group but are not shared with the virus group. As a result, drugs that block one of these life processes in one member of the group is likely to be effective against many other members of the group. But the same drug will not work against a microbe belonging to a different group.

As an example, let us take antibiotics. They commonly block biochemical pathways important for bacteria. Many bacteria, for example, make a cell-wall to protect themselves. The antibiotic penicillin blocks the bacterial processes that build the cellwall. As a result, the growing bacteria become unable to make cell-walls, and die easily. Human cells don't make a cell-wall anyway, so penicillin cannot have such an effect on us. Penicillin will have this effect on any bacteria that use such processes for making cell-walls. Similarly, many antibiotics work against many species of bacteria rather than simply working against one.

But viruses do not use these pathways at all, and that is the reason why antibiotics do not work against viral infections. If we have a common cold, taking antibiotics does not reduce the severity or the duration of the disease. However, if we also get a bacterial infection along with the viral cold, taking antibiotics will help. Even then, the antibiotic will work only against the bacterial part of the infection, not the viral infection.

Activity 13.5

- Find out how many of you in your class had cold/cough/fever recently.
- How long did the illness last?
- How many of you took antibiotics (ask your parents if you had antibiotics)?
- How long were those who took antibiotics ill?
- How long were those who didn't take antibiotics ill?
- Is there a difference between these two groups?
- If yes, why? If not, why not?

13.3.2 Means of Spread

How do infectious diseases spread? Many microbial agents can commonly move from an affected person to someone else in a variety of ways. In other words, they can be 'communicated', and so are also called communicable diseases.
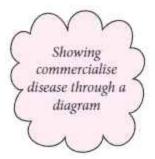
Such disease-causing microbes can spread through the air. This occurs through the little droplets thrown out by an infected person who sneezes or coughs. Someone standing close by can breathe in these droplets, and the microbes get a chance to start a new infection. Examples of such
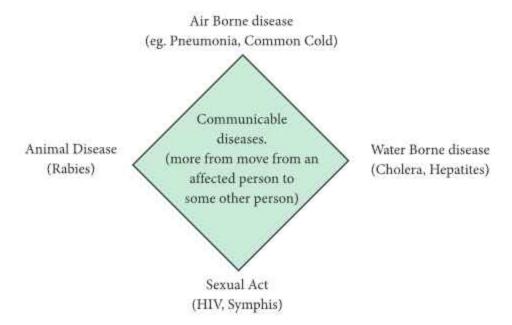
diseases spread through the air are the common cold, pneumonia and tuberculosis.

We all have had the experience of sitting near someone suffering from a cold and catching it ourselves. Obviously, the more crowded our living conditions are, the more likely it is that such airborne diseases will spread.

Diseases can also be spread through water. This occurs if the excreta from someone suffering from an infectious gut disease, such as cholera, get mixed with the drinking water used by people living nearby. The choleracausing microbes will enter new hosts through the water they drink and cause disease in them. Such diseases are much more likely to spread in the absence of safe supplies of drinking water.

Showing commercialise disease through a diagram

Air Borne disease
(eg. Pneumonia, Common Cold)

Animal Disease
(Rabies)

Communicable diseases.
(more from move from an affected person to some other person)

Water Borne disease
(Cholera, Hepatites)

Sexual Act
(HIV, Symphis)

The sexual act is one of the closest physical contact two people can have with each other. Not surprisingly, there are microbial diseases such as syphilis or AIDS that are transmitted by sexual contact from one partner to the other. However, such sexually transmitted diseases are not spread by casual physical contact. Casual physical contacts include handshakes or hugs or sports, like wrestling, or by any of the other ways in which we touch each other socially. Other than the sexual contact, the AIDS virus can also spread through blood-to-blood contact with infected people or from an infected mother to her baby during pregnancy or through breast feeding.

We live in an environment that is full of many other creatures apart from us. It is inevitable that many diseases will be transmitted by other animals. These animals carry the infecting agents from a sick person to another
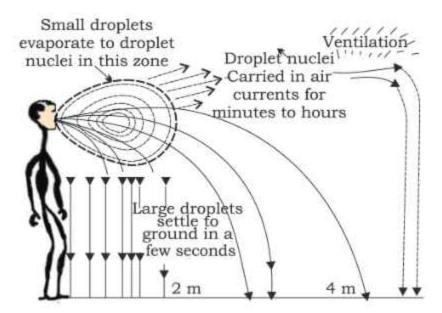
Figure 13.2: Air-transmitted diseases are easier to catch the closer we are to the infected person. However, in closed areas, the droplet nuclei recirculate and pose a risk to everybody. Overcrowded and poorly ventilated housing is therefore a major factor in the spread of airborne diseases.

potential host. These animals are thus the intermediaries and are called vectors. The commonest vectors we all know are mosquitoes. In many species of mosquitoes, the females need highly nutritious food in the form of blood in order to be able to lay mature eggs. Mosquitoes feed on many warm-blooded animals, including us. In this way, they can transfer diseases from person to person.

13.3.3 Organ-specific and Tissuespecific Manifestations

The disease-causing microbes enter the body through these different means. Where do they go then? The body is very large when compared to the microbes. So there are many possible places, organs or tissues, where they could go. Do all microbes go to the same tissue or organ, or do they go to different ones?

Different species of microbes seem to have evolved to home in on different parts of the body. In part, this selection is connected to their point of entry. If they enter from the air via the nose, they are likely to go to the lungs. This is seen in the bacteria causing tuberculosis. If they enter through the mouth, they can stay in the gut lining like typhoidcausing bacteria. Or they can go to the liver, like the viruses that cause jaundice.
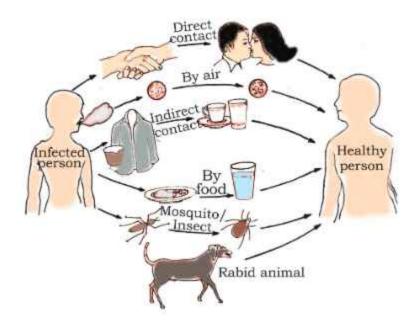
Figure 13.3: Common methods of transmission of diseases.

But this needn't always be the case. An infection like HIV, that comes into the body via the sexual organs, will spread to lymph nodes all over the body. Malaria-causing microbes, entering through a mosquito bite, will go to the liver, and then to the red blood cells. The virus causing Japanese encephalitis, or brain fever, will similarly enter through a mosquito bite. But it goes on to infect the brain.

The signs and symptoms of a disease will thus depend on the tissue or organ which the microbe targets. If the lungs are the targets, then symptoms will be cough and breathlessness. If the liver is targeted, there will be jaundice. If the brain is the target, we will observe headaches, vomiting, fits or unconsciousness. We can imagine what the symptoms and signs of an infection will be if we know what the target tissue or organ is, and the functions that are carried out by this tissue or organ.

In addition to these tissue-specific effects of infectious disease, there will be other common effects too. Most of these common effects depend on the fact that the body's immune system is activated in response to infection. An active immune system recruits many cells to the affected tissue to kill off the disease-causing microbes. This recruitment process is called inflammation. As a part of this process, there are local effects such as swelling and pain, and general effects such as fever.

In some cases, the tissue-specificity of the infection leads to very general-seeming effects. For example, in HIV infection, the virus goes to the immune system and damages its function. Thus, many of the effects of HIV-AIDS are because the body can no longer fight off the many minor infections

that we face everyday. Instead, every small cold can become pneumonia. Similarly, a minor gut infection can produce major diarrhoea with blood loss. Ultimately, it is these other infections that kill people suffering from HIV-AIDS.

It is also important to remember that the severity of disease manifestations depend on the number of microbes in the body. If the number of microbes is very small, the disease manifestations may be minor or unnoticed. But if the number is of the same microbe large, the disease can be severe enough to be life-threatening. The immune system is a major factor that determines the number of microbes surviving in the body. We shall look into this aspect a little later in the chapter.

13.3.4 Principles of Treatment

Diagram to show two ways of treatment of disease

What are the steps taken by your family when you fall sick? Have you ever thought why you sometimes feel better if you sleep for some time? When does the treatment involve medicines?

Based on what we have learnt so far, it would appear that there are two ways to treat an infectious disease. One would be to reduce the effects of the disease and the other to kill the cause of the disease. For the first, we can provide treatment that will reduce the symptoms. The symptoms are usually because of inflammation. For example, we can take medicines that bring down fever, reduce pain or loose motions. We can take bed rest so that we can conserve our energy. This will enable us to have more of it available to focus on healing.

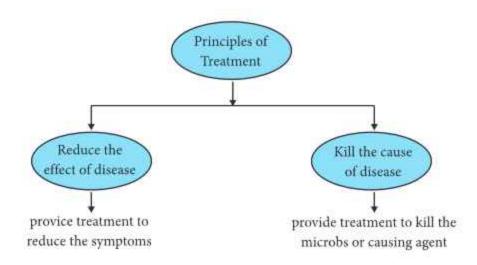*Role play by students to show the treatment of disease by doctor.*

Principles of Treatment

Reduce the effect of disease → provice treatment to reduce the symptoms

Kill the cause of disease → provide treatment to kill the microbs or causing agent

But this kind of symptom-directed treatment by itself will not make the infecting microbe go away and the disease will not be cured. For that, we need to be able to kill off the microbes.

How do we kill microbes? One way is to use medicines that kill microbes. We have seen earlier that microbes can be classified into different categories. They are viruses, bacteria, fungi or protozoa. Each of these groups of organisms will have some essential biochemical life process which is peculiar to that group and not shared with the other groups. These processes may be pathways for the synthesis of new substances or respiration.

These pathways will not be used by us either. For example, our cells may make new substances by a mechanism different from that used by bacteria. We have to find a drug that blocks the bacterial synthesis pathway without affecting our own. This is what is achieved by the antibiotics that we are all familiar with. Similarly, there are drugs that kill protozoa such as the malarial parasite.

One reason why making anti-viral medicines is harder than making antibacterial medicines is that viruses have few biochemical mechanisms of their own. They enter our cells and use our machinery for their life processes. This means that there are relatively few virus-specific targets to aim at. Despite this limitation, there are now effective anti-viral drugs, for example, the drugs that keep HIV infection under control.

13.3.5 Principles of Prevention

All of what we have talked about so far deals with how to get rid of an infection in someone who has the disease. But there are three limitations of this approach to dealing with infectious disease. The first is that once someone has a disease, their body functions are damaged and may never recover completely. The second is that treatment will take time, which means that someone suffering from a disease is likely to be bedridden for some time even if we can give proper treatment. The third is that the person suffering from an infectious disease can serve as the source from where the infection may spread to other people. This leads to the multiplication of the above difficulties. It is because of such reasons that prevention of diseases is better than their cure.

How can we prevent diseases? There are two ways, one general and one specific to each disease. The general ways of preventing infections mostly relate to preventing exposure. How can we prevent exposure to infectious microbes?

Activity 13.6

- Conduct a survey in your locality. Talk to ten families who are well-off and ten who are very poor (in your estimation). Both sets of families should have children who are below five years of age. Measure the heights of these children. Draw a graph of the height of each child against its age for both sets of families.
- Is there a difference between the groups? If yes, why?
- If there is no difference, do you think that your findings mean that being well-off or poor does not matter for health?

If we look at the means of their spreading, we can get some easy answers. For airborne microbes, we can prevent exposure by providing living conditions that are not overcrowded. For water-borne microbes, we can prevent exposure by providing safe drinking water. This can be done by treating the water to kill any microbial contamination. For vector-borne infections, we can provide clean environments. This would not, for example, allow mosquito breeding. In other words, public hygiene is one basic key to the prevention of infectious diseases.

In addition to these issues that relate to the environment, there are some other general principles to prevent infectious diseases. To appreciate those principles, let us ask a question we have not looked at so far. Normally, we are faced with infections everyday. If someone is suffering from a cold

Immunisation

Traditional Indian and Chinese medicinal systems sometimes deliberately rubbed the skin crusts from smallpox victims into the skin of healthy people. They thus hoped to induce a mild form of smallpox that would create resistance against the disease.

Famously, two centuries ago, an English physician named Edward Jenner, realised that milkmaids who had had cowpox did not catch smallpox even during epidemics. Cowpox is a very mild disease. Jenner tried deliberately giving cowpox to people (as he can be seen doing in the picture), and found that they were now resistant to smallpox. This was because the smallpox virus is closely related to the cowpox virus. 'Cow' is 'vacca' in Latin, and cowpox is 'vaccinia'. From these roots, the word immunisation.

and cough in the class, it is likely that the children sitting around will be exposed to the infection. But all of them do not actually suffer from the disease. Why not?
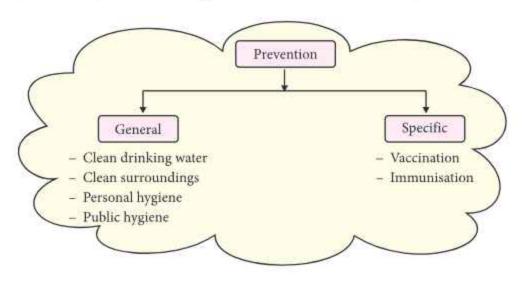
This is because the immune system of our body is normally fighting off microbes. We have cells that specialise in killing infecting microbes. These cells go into action each time infecting microbes enter the body. If they are successful, we do not actually come down with any disease. The immune cells manage to kill off the infection long before it assumes major proportions. As we noted earlier, if the number of the infecting microbes is controlled, the manifestations of disease will be minor. In other words, becoming exposed to or infected with an infectious microbe does not necessarily mean developing noticeable disease.

So, one way of looking at severe infectious diseases is that it represents a lack of success of the immune system. The functioning of the immune system, like any other system in our body, will not be good if proper and sufficient nourishment and food is not available. Therefore, the second basic principle of prevention of infectious disease is the availability of proper and sufficient food for everyone.

Chart showing the ways of prevention

These are the general ways of preventing infections. What are the specific ways? They relate to a peculiar property of the immune system that usually fights off microbial infections. Let us cite an example to try and understand this property.

These days, there is no smallpox anywhere in the world. But as recently as a hundred years ago, smallpox epidemics were not at all uncommon. In such an epidemic, people used to be very afraid of coming near someone suffering from the disease since they were afraid of catching the disease.

However, there was one group of people who did not have this fear. These people would provide nursing care for the victims of smallpox. This was

Prevention

General
- Clean drinking water
- Clean surroundings
- Personal hygiene
- Public hygiene

Specific
- Vaccination
- Immunisation

a group of people who had had smallpox earlier and survived it, although with a lot of scarring. In other words, if you had smallpox once, there was no chance of suffering from it again. So, having the disease once was a means of preventing subsequent attacks of the same disease.

This happens because when the immune system first sees an infectious microbe, it responds against it and then remembers it specifically. So the next time that particular microbe, or its close relatives enter the body, the immune system responds with even greater vigour. This eliminates the infection even more quickly than the first time around. This is the basis of the principle of 'vaccination' has come into our usage.

We can now see that, as a general principle, we can 'fool' the immune system into developing a memory for a particular infection by putting something, that mimics the microbe we want to vaccinate against, into the body. This does not actually cause the disease but this would prevent any subsequent exposure to the infecting microbe from turning into actual disease.

QUESTIONS

1. Why are we normally advised to take bland and nourishing food when we are sick?
2. What are the different means by which infectious diseases are spread?
3. What precautions can you take in your school to reduce the incidence of infectious diseases?
4. What is immunisation?
5. What are the immunisation programmes available at the nearest health centre in your locality? Which of these diseases are the major health problems in your area?

Many such vaccines are now available for preventing a whole range of infectious diseases, and provide a disease-specific means of prevention. There are vaccines against tetanus, diphtheria, whooping cough, measles, polio and many others. These form the public health programme of childhood immunisation for preventing infectious diseases.

Of course, such a programme can be useful only if such health measures are available to all children. Can you think of reasons why this should be so?

Some hepatitis viruses, which cause jaundice, are transmitted through water. There is a vaccine for one of them, hepatitis A, in the market. But the majority of children in many parts of India are already immune to hepatitis A by the time they are five years old. This is because they are

exposed to the virus through water. Under these circumstances, would you take the vaccine?

Activity 13.7

- Rabies virus is spread by the bite of infected dogs and other animals. There are anti-rabies vaccines for both humans and animals. Find out the plan of your local authority for the control of rabies in your neighbourhood. Are these measures adequate? If not, what improvements would you suggest?

What you have you have learnt

- Health is a state of physical, mental and social well-being.
- The health of an individual is dependent on his/her physical surroundings and his/her economic status.
- Diseases are classified as acute or chronic, depending on their duration.
- Disease may be due to infectious or non-infectious causes.
- Infectious agents belong to different categories of organisms and may be unicellular and microscopic or multicellular.
- The category to which a disease-causing organism belongs decides the type of treatment.
- Infectious agents are spread through air, water, physical contact or vectors.
- Prevention of disease is more desirable than its successful treatment.
- Infectious diseases can be prevented by public health hygiene measures that reduce exposure to infectious agents.
- Infectious diseases can also be prevented by using immunisation.
- Effective prevention of infectious diseases in the community requires that everyone should have access to public hygiene and immunisation.

Exercises

1. What are one changes that can save you from getting ill.
2. Anything in your immediate surrounding cause you more illness.
3. What are the precautions by doctors to save him from getting ill.
4. Write about main disease that caused more people ill.
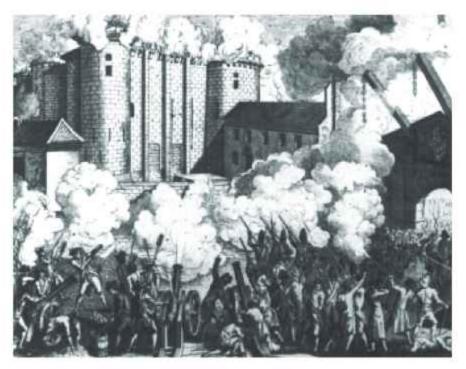5. Write are symptom of ill children.

फ्रांसीसी क्रांति

चौदह जुलाई 1789 की सुबह, पेरिस नगर में आतंक का माहौल था। सम्राट ने सेना को शहर में घुसने का आदेश दे दिया था। अफ़वाह थी कि वह सेना को नागरिकों पर गोलियाँ चलाने का आदेश देने वाला है। लगभग 7000 मर्द तथा औरतें टॉउन हॉल के सामने एकत्र हुए और उन्होंने एक जन-सेना का गठन करने का निर्णय किया। हथियारों की खोज में वे बहुत-से सरकारी भवनों में जबरन प्रवेश कर गए।

अंततः सैकड़ों लोगों का एक समूह पेरिस नगर के पूर्वी भाग की ओर चल पड़ा और **बास्तील** (Bastille) किले की जेल को तोड़ डाला जहाँ भारी मात्रा में गोला-बारूद मिलने की संभावना थी। हथियारों पर कब्ज़े की इस सशस्त्र लड़ाई में बास्तील का कमांडर मारा गया और कैदी छुड़ा लिए गए, यद्यपि उनकी संख्या केवल सात थी। सम्राट की निरंकुश शक्तियों का प्रतीक होने के कारण बास्तील किला लोगों की घृणा का केंद्र था। इसलिए किले को ढहा दिया गया और उसके अवशेष बाज़ार में उन लोगों को बेच दिए गए जो इस ध्वंस को बतौर स्मृति-चिह्न संजोना चाहते थे। इस घटना के बाद कई दिनों तक पेरिस तथा देश के देहाती क्षेत्रों में कई और संघर्ष हुए। अधिकांश जनता पावरोटी की महँगी कीमतों का विरोध कर रही थी। बाद में इस दौर का सिंहावलोकन करते हुए इतिहासकारों ने इसे एक लंबे घटनाक्रम की ऐसी शुरुआती कड़ियों के रूप में देखा जिनकी परिणति फ़्रांस के सम्राट को फाँसी दिए जाने में हुई, हालाँकि उस समय अधिकांश लोगों को ऐसे नतीजे की उम्मीद नहीं थी। ऐसा क्यों और कैसे हुआ?

चित्र 1–बास्तील का ध्वंस

बास्तील ध्वंस के बाद चित्रकारों ने इस घटना की याद में कई चित्र बनाए।

अठारहवीं सदी के उत्तरार्ध में फ्रांसीसी समाज

सन् 1774 में बूर्बों राजवंश का **लुई XVI** फ्रांस की राजगद्दी पर आसीन हुआ। उस समय उसकी उम्र केवल बीस साल थी और उसका विवाह ऑस्ट्रिया की राजकुमारी मेरी एन्तोएनेत से हुआ था। राज्यारोहण के समय उसने राजकोष खाली पाया। लंबे समय तक चले युद्धों के कारण फ्रांस के वित्तीय संसाधन नष्ट हो चुके थे। **वर्साय (Versailles)** के विशाल महल और राजदरबार की शानो-शौकत बनाए रखने की फिज़ूलखर्ची का बोझ अलग से था। **लुई XVI** के शासनकाल में फ्रांस ने अमेरिका के 13 उपनिवेशों को साझा शत्रु ब्रिटेन से आज़ाद कराने में सहायता दी थी। इस युद्ध के चलते फ्रांस पर दस अरब लिब्रे से भी अधिक का कर्ज़ और जुड़ गया जबकि उस पर पहले से ही दो अरब **लिब्रे** का बोझ चढ़ा हुआ था। सरकार से कर्ज़दाता अब 10 प्रतिशत ब्याज की माँग करने लगे थे। फलस्वरूप फ्रांसीसी सरकार अपने बजट का बहुत बड़ा हिस्सा दिनोंदिन बढ़ते जा रहे कर्ज़ को चुकाने पर मजबूर थी। अपने नियमित खर्चों जैसे, सेना के रख-रखाव, राजदरबार, सरकारी कार्यालयों या विश्वविद्यालयों को चलाने के लिए फ्रांसीसी सरकार करों में वृद्धि के लिए बाध्य हो गई पर यह कदम भी नाकाफ़ी था। अठारहवीं सदी में फ्रांसीसी समाज तीन एस्टेट्स में बँटा था और केवल तीसरे **एस्टेट** के लोग (जनसाधारण) ही कर अदा करते थे।

चित्र 2–एस्टेट्स का समाज

ध्यान दें कि तृतीय एस्टेट में कुछ लोग अमीर हैं तो कुछ गरीब भी हैं।

वर्गों में विभाजित फ़्रांसीसी समाज मध्यकालीन सामंती व्यवस्था का अंग था। 'प्राचीन राजतंत्र' पद का प्रयोग सामान्यतः सन् 1789 से पहले के फ़्रांसीसी समाज एवं संस्थाओं के लिए होता है।

चित्र 2 फ़्रांसीसी समाज की वर्ग-व्यवस्था को दर्शाता है। पूरी आबादी में लगभग 90 प्रतिशत किसान थे। लेकिन, ज़मीन के मालिक किसानों की संख्या बहुत कम थी। लगभग 60 प्रतिशत ज़मीन पर कुलीनों, चर्च और तीसरे एस्टेट्स के अमीरों का अधिकार था। प्रथम दो एस्टेट्स, कुलीन वर्ग एवं **पादरी वर्ग** के लोगों को कुछ विशेषाधिकार जन्मना प्राप्त थे। इनमें से सबसे महत्त्वपूर्ण विशेषाधिकार था—राज्य को दिए जाने वाले करों से छूट। कुलीन वर्ग को कुछ अन्य सामंती विशेषाधिकार भी हासिल थे। वह किसानों से सामंती कर वसूल करता था। किसान अपने स्वामी की सेवा—स्वामी के घर एवं खेतों में काम करना, सैन्य सेवाएँ देना अथवा सड़कों के निर्माण में सहयोग आदि—करने के लिए बाध्य थे।

चर्च भी किसानों से करों का एक हिस्सा, **टाइद** (Tithe, धार्मिक कर) के रूप में वसूलता था। ऊपर से तीसरे एस्टेट के तमाम लोगों को सरकार को तो कर चुकाना ही होता था। इन करों में **टाइल** (Taille, प्रत्यक्ष कर) और अनेक अप्रत्यक्ष कर शामिल थे। अप्रत्यक्ष कर नमक और तम्बाकू जैसी रोज़ाना उपभोग की वस्तुओं पर लगाया जाता था। इस प्रकार राज्य के वित्तीय कामकाज का सारा बोझ करों के माध्यम से जनता वहन करती थी।

नए शब्द

लिव्रे	: फ़्रांस की मुद्रा जिसे 1794 में समाप्त कर दिया गया।
एस्टेट	: क्रांति-पूर्व फ़्रांसीसी समाज में सत्ता और सामाजिक हैसियत को अभिव्यक्त करने वाली श्रेणी।
पादरी वर्ग	: चर्च के विशेष कार्यों को करने वाले व्यक्तियों का समूह।
टाइद	: चर्च द्वारा वसूल किया जाने वाला कर। यह कर कृषि उपज के फ़ दसवें हिस्से के बराबर होता था।
टाइल	: सीधे राज्य को अदा किया जाने वाला कर।
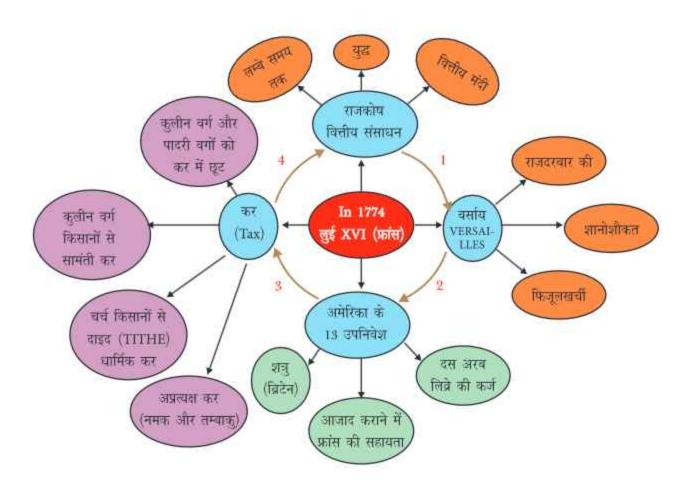
Important points to be considered while making adaptation in social science for hearing Impaired children

1. Concept Mapping (Cluster Map)
2. Multicoloured Pictures with Indian context.
3. The font size of the letter a little bit bigger in comparison to the present text book letter.
4. Important historical words and dates should be bold and coloured.
5. Web link hints to different topics should be enlisted at the end.

CONCEPT MAPPING (Cluster Map)

"His First Flight"

Liam O'Fla

I. His First Flight

Mother of seagull

Father of seagull

Two brothers of seagull

Sister of seagull

Synopsis

The young seagull was alone on his **ledge**. The two brothers and the sister had run to the edge of the ledge and flew away. The young seagull also ran to the **edge** and tried to flap his wings to fly., But he became afraid. The young seagull's parents came around to take him with them. They told him that he would starve on the ledge. Two days passed. The young seagull was feeling hungry. He cried begging his mother to bring him some food. She picked up a piece of fish in her beak and stood just in front of him. The young seagull was mad with hunger and dived at the fish. He began to fly. All the family numbers praised the seagull. That was his first flight.

I. His First Flight

The young seagull was alone on his **ledge**. His two brothers and his sister had already flown away the day before. He had been afraid to fly with them. Somehow when he had taken a little run forward to the **corner edge** of the ledge and attempted to flap his wings he became afraid. The great expanse of sea stretched down beneath, and it was such a long way down — miles down. He felt certain that his wings would never support him; so he bent his head and ran away back to the little hole under the ledge where he slept at night. Even when each of his brothers and his little sister, whose wings were far shorter than his own, ran to the brink, flapped their wings, and flew away, he failed to **muster** up courage to take that **plunge** which appeared to him so **desperate**. His father and mother had come around.

Young seagull
All in ledge

Picture of ledge
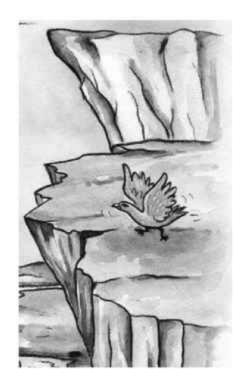
Ledge	–	Unever rock
edge	–	corner
Brink	–	cornoer edge
Muster	–	Collect
Plunge	–	Jump
Desperate	–	Terrible

Leadge   ⟶   Uneven rock

edge   ⟶   corner

SPEECH BALLOON

"Ga, ga, ga," he cried begging her to bring him some food. "Gaw-col-ah."

SPEECH BALLOON
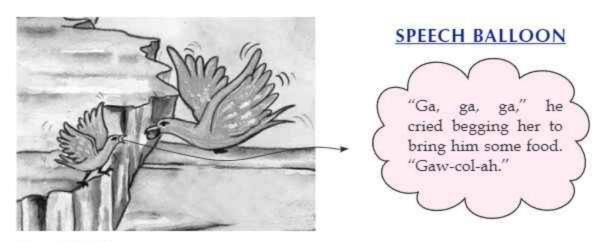
"Ga, ga, ga," he cried begging her to bring him some food. "Gaw-col-ah."

Flow Chart

The young seagull was alone on his ledge

↓

The two brothers and the sister had run to the edge of the ledge and flew away.

↓

The young seagull also ran to the edge and tried to flap his wings to fly. But he become afraid.

↓

The young seagull's parents came around to take him with them.

↓

They told him that he would starve on the ledge.

↓

Two days passed. The young seagull was feeling hungry.

↓

He cried begging his mother to bring him some food.

↓

She picked up a piece of fish in her beak and stood just in front of him.

↓

The young seagull was mad with hunger and dived at the fish.

↓
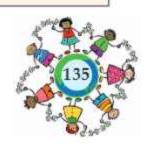
He began to fly. All the family members praised the seagull. That was his first flight.

Adaptation Strategy in Text Book Content and Question Bank

- Names of all the characters with multi coloured pictures.

- Summarizing the chapter in synopsis form (reference marks enclosed)

OR
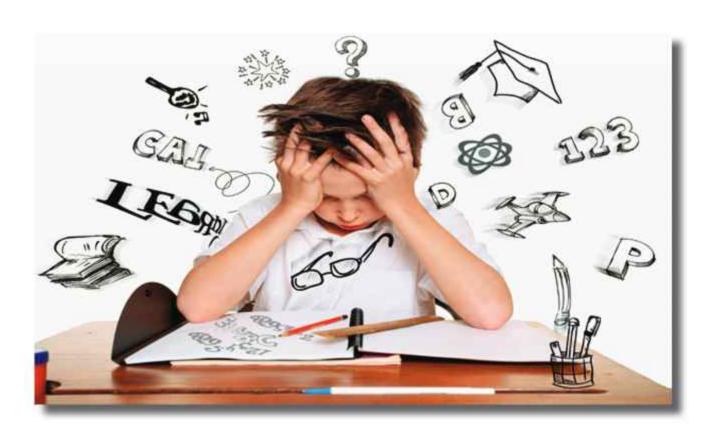
- Flow chart form (reference marks enclosed)

- Highlight the new words with bold letters in different colour

- Repetition of new words

- Glossary of different words should be more.

- Indian context pictures

- Speech balloon with conversational output

- Value based questions should be given, if should not be based on abstract thinking but it should be based on child's immediate environment practical life experience

- Reduce difficult structural questions.

- Breakup the question

- One assessment should be given on non-verbal expression

For example:
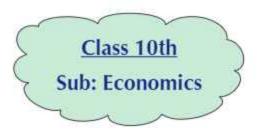
(a) dramatization

(b) One act play

(c) Act using mine.

Adaptation for Children with Learning Disability [LD]

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Family Income

Objectives

1. Student should understand that MONEY is an important resource to fulfill all our needs and requirements.

2. Students should be able to correctly identify coins/rupees and its assigned value.

3. Student should be able to read different prices tags of various items.

4. Students will be able to understand the concept of spending less than they possess and create a budget for themselves.

5. Students should be able to calculate prices of different items and make total payment.

6. Students should be able to purchase item of his needs independently.
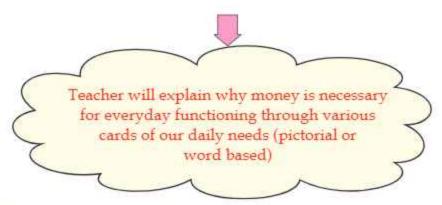
Contents

Types of family income, needs and ways of supplementing family income, need and ways of keeping household accounts.

Money is perhaps the most important resource that can fulfill almost all family needs and helps to maintain standard of living. As we all know

that money is a limited resource for most of the families, therefore, money management becomes even more important task for a family. Maintaining a proper balance between income and expenditure is very important to avoid financial problems in future.

Teacher will explain why money is necessary for everyday functioning through various cards of our daily needs (pictorial or word based)

Family Income
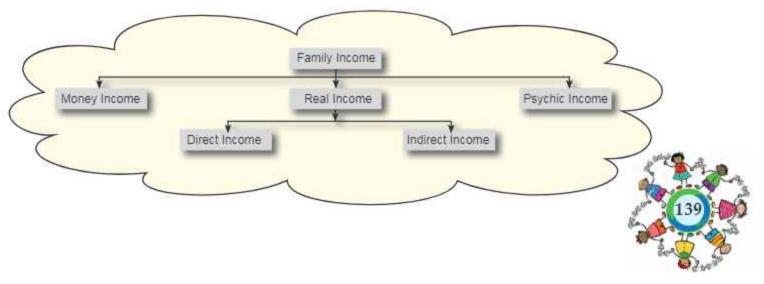
The money that members of a family earn in cash from different sources is called income. Other than this income a family might avail some facilities without spending any money, such as - driver, servant, etc. These facilities are also a part of the family income but in an indirect way. Similarly, income through use of human resources is also a part of indirect income. In simple words-

"Family income includes money income, income from other source, goods and services received by a family and the satisfaction derived by them by using these resources."

According to Gross and Crandall - *"Family income is that stream of money, goods, services and satisfactions that are under the control of a family and to be used by them to fulfill their needs, desires and obligations."*

Family income comprises of - money income, real income (direct and indirect) and psychic income.

1. Creating a budget
2. How to write cheques
3. Importance of getting a job
4. Talk about want vs Needs
5. People earn money by working

1. **Money Income:** Money income is the cash earned by a family from any source over a period of time. According to Gross and Crandall, "Money income is defined as the purchasing power or the flow of money available over a given period of time. "Sources of money income are salary, wages, pension, gifts, bonus, rent, etc.

2. **Real Income:** Real income is the stream of goods and services available to a family over a period of time. According to Gross and Crandall, "Real income is a flow of commodities and services available for the satisfaction of human wants and needs over a given period of time."

Real income is of two types:

(a) **Real Direct Income:** Services or facilities which a family receives from their workplace is known as Real Direct Income. In the absence of these services/facilities, the family had to spend their money to avail them, for e.g., cab services/conveyance provided by the company, reimbursement of expenditure on petrol, medical, telephone bills, uniform, provision of gardener, driver, etc. These services are also known as 'Fringe Benefits'.

(b) **Real Indirect Income:** It includes goods and services received y a family by using their human resources like — knowledge, skills, interests, etc. instead of spending on them, for e.g., producing vegetables in the kitchen garden, teaching children at home instead of sending them for tuition, by repairing electrical appliances on their own, by stitching their own clothes, by making pickles, pappads, jams etc. at home application at home etc.

Barter/exchange of goods is also an another source of Real Indirect Income for e.g., a lady many give some homemade pappads or pickles to another lady who gives tuitions to her children in return.

Real income of a family largely depends on the skills, abilities, interests and knowledge of the family members. Real income can be derived from properties and possessions owned by a family. Skills, efforts and abilities of the family members and also from availing community facilities. A family can increase their real income and save money by using their knowledge and skills. Judicious and thoughtful selection/purchase, upkeep and use of resources increase their lifespan. A family can even save their money income by use of facilities provided by the government, such-as-free use of libraries, parks, community centers, government hospitals, government schools, etc. Therefore, we can say that there can be difference in the

real income of two families staying in the same place and having equal money income.

3. **Psychic Income:** According to Gross and Crandall, "Psychic income consists of satisfaction when a person derives from the use of money income and real income over a given period of time." Psychic income is completely personal and is not quantitative and differs from person to person. It depends on the viewpoint and values of an individual. For e.g., some people may get satisfied by watching films, cooking or travelling to tourist spots while some may get satisfaction by investing in shares.

Factors Affecting Family Income

Family income depends on various factors, such as:

(a) Educational qualification of the members of a family.

(b) Number of earning members in that family.

(c) Skills and talents of individual members of that family.

(d) Type/category of work. For e.g., a businessman may earn more than a teacher or any other salaried class person.

Supplementing Family Income

Family income is that limited resource through which individual needs of every family member is to be fulfilled. Now-a-days, where price index is rising day by day and requirements/demands are also increasing, additional income has to be generated to maintain a balance between income and expenditure. The need to do so mainly arises due to the following reasons:

1. **To Fulfill the Family/Personal Needs:** Every individual in a family has some set goals for themselves which are to be achieved through the available resources. In present times, it is difficult to achieve these goals with the limited source of income. Therefore, it becomes necessary to supplement income by using all the available resources.

2. **For a Secure Future:** An intelligent person always believes in saving some money for future needs and emergencies. It is possible to save money for the future only if we plan our savings. Therefore, if we are unable to save from our limited income, we must supplement it through other sources of income and save for our resources.

3. **To Raise the Standard of Living** : Every individual aspires to improve his/her comforts to the optimum, supplementary income is a must.

4. **Inflation:** The family needs to supplement their income to deal with the rising prices of goods day by day.

5. **Special Circumstances** : The family needs to be supplemented to tackle the following special circumstances:-

   (a) Emergency situations, such as — accident, death, financial loss, etc.

   (b) Family functions.

6. **To Meet the Financial Responsibilities During Expanding Stage of Family Life Cycle and Large Family Size:**

   (a) Expanding stage of family life cycle: Family needs keep on changing according to the different stages of the family life cycle. For e.g., expenditure of children's education, clothing, supplementary income is a must.

   (b) Large Family: Increase in the number of members in a family puts an extra burden on limited resources of income. Hence, it is essential to supplement family income to fulfil the basic needs of a large family and to achieve their goals.

Ways of Supplementing Family Income

1. **Adopting Income Generating Activities** : Income can be supplemented by utilizing human resources like knowledge, skills, ability, capacity and time. For e.g., making papad, vadis, pickles, henna application, stitching, embroidery, etc. are some activities which can be undertaken as occupation to supplement family income.

2. **Part time job** : Any member of the family can supplement income by taking up part time jobs. These jobs can also be undertaken either before or after office hours. For e.g., doing over time in same office, maintaining accounts in some factory or shop in the evenings, taking tuitions, working in call centres, taking us summer jobs, etc.

3. **Proper Investment of Savings** : Keeping your savings at home has no appreciation value. Investing this money. In sound schemes will give an additional income in the form of interest.

4. **By Increasing Real Income** : Family members can also earn income by using their knowledge, skills, interests, etc. For e.g., stitching clothes at home, growing vegetable in the kitchen garden, repairing of electrical appliances at home only, etc. by some members can increase family's real income. It's a famous saying that, "Money saved is Money gained."

Teach steps on how to open a savings bank accounts.

5. **Judicious and Economical Spending** : Thoughtful spending and budgeting helps in economizing the expenditure.

6. **Proper Use of Available Resources** : Proper use of available resources can also supplement family income. For e.g., if the house is bigger than the requirement of the family, then one or two rooms can be rented out or a crèche can be opened in the extra space. One can borrow books/magazines from a nearby public library instead of purchasing them.

7. **Cut in Expenditure** : To supplement family income, cutting down the expenditure has the same importance as that of increasing the income. Expenditure can be minimised by proper management of income and proper use of available resources. Such as:

   (a) Judicious and economical spending can help in cutting down expenses.

   (b) Judicious spending means first spending money on necessities and then on comforts and luxuries. Expenses on essential commodities may remain the same but sometimes their quantity can be reduced.

   (c) Appropriate spending also helps to bring down expenditure. Every housewife should make purchase only after comparing rates from three or four shops. Instead of purchasing expensive items, one can always go for comparatively less expensive substitutes. Buy seasonal fruits and vegetables which are comparatively cheaper. One can also reduce expenses by making purchases from wholesale or government shops.

   (d) Frequent use of government facilities and services also helps in curtailing expenditure. For e.g., one can save money on books, etc. by borrowing them from a nearby public library instead of buying them. Going to government hospitals, schools, colleges, etc. also helps in saving money.

   (e) Making a budget is a must for judicious spending.

Budget

Teacher will explain budgeting allows you to creat a spending plan for your money. It ensures that you will always have enough money for the things you used and important for you.

Budgeting is an important aspect of keeping household accounts. It not only helps us to keep a check on the proper use of family income, but also keeps wasteful expenditure in control. A budget can be prepared both mentally and on records. But, if we prepare a budget mentally, it cannot be referred to after sometime. On the other hand a recorded budget can be referred to anytime.

According to Krome and Rush, "Budget is a tentative estimate of fixed expenditures based on past expenditures, future estimated expenditure and present circumstances over a fixed period of time."

Success of a budget depends upon its being realistic, flexible and according to the needs of the family members.

| MY SPENDINGS | | | | MY SAVINGS | | | |
| Where have I spent my money? | | | | My monthly savings record | | | |
Date	Deposit	Amount	Total	Date	Description of Deposit	Amount	Total

Steps in Making Family Budget

Teacher can discuss with the students what are the things they use on daily basis and their prices

List of things	Prices
1. Milk	40
2. Rice	80
3. Wheat	25
4. Shampoo	80
5. Petrol	1000
6. Phone Call expenses	50

(a) Specifying the time limit of the budget (daily, weekly or monthly)

(b) Preparing a list of the needs or requirements.

(c) Prioritising the needs on the basis of their requirements.

(d) Estimating the expected income.

(e) Estimating the expected expenditure.

(f) Balancing the expected expenditure and the expected income.

Expenditure

The amount of money spent to fulfil family needs and to achieve family goals is known as expenditure.

Expenditure of a family mainly depends on the ability of the family members to earn money. Other than this expenditure also depends on family's real and psychic income. Generally, family expenditures is of three types.

1. **Fixed Expenditures :** These are the regular/fixed expenditures of a family and no reduction can be made in them, for e.g., house rent, school fees, bills, groceries, etc.

2. **Semi-fixed Expenditures :** Expenditure on certain items can be increased or decreased such as in case of marriage or festival, expenditure on clothes increases or if some guests come at home, then expenditure on the food increases.

3. **Other Expenditures :** Some expenditures are not mandatory. Such expenditures are only possible if a family has spare money after spending on fixed and semi-fixed expenditures. Such expenditures can be on entertainment or on luxury and comfort goods.

Factors Affecting Expenditure

1. **Sources of Family Income :** If the housewife and other family members also along with the head of the family, the income and purchasing power of the family will increase.

2. **Structure of the Family :** In comparison to a nuclear family, there is less expenditure on house, kitchen per person in a joint family.

3. **Age of Family Members :** The expenditure on education, food, clothing etc. is more or less depending on the number of children in the family.

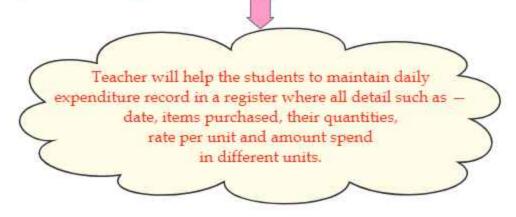4. **Standard of Living :** The higher the level of living standard of the family, more the expenditure will be.

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5. **Residence or Place of Stay** : Families residing in urban areas spend more than those residing in rural areas.

6. **Family Traditions** : Some families have more faith in certain social and religious traditions and sometimes spend lavishly on their respective rituals. Apart from expenditure on three basic necessities of a family i.e. food, clothing and housing, expenditure on other requirements is different for different families, For e.g., expenditure in some families is more on education than on entertainment and vice versa.

7. **Available Resources** : Expenditure can often be reduced by proper utilization of human resources. For, e.g., expenditure on education can be reduced by teaching the child at home instead of tuitions, similarly, if a housewife knows stitching she may stitch clothes at home only and can save on the stitching charges.

Maintaining Household Accounts

Benefits of Maintaining Household Accounts

(a) Maintaining household accounts helps to prevent wasteful expenditure.

(b) Helps in comparing prices.

(c) Makes the person conscious about saving and spending money judiciously.

(d) Helps to keep a check on lending habits.

(e) Achieving family goals becomes easier.

(f) Helps to know we exact amount of income available to the family.

(g) Helps to maintain a balance between income and expenditure.

(h) Serves as a guide for current and future expenses.

Ways of Maintaining Household Accounts

Teacher will help the students to maintain daily expenditure record in a register where all detail such as — date, items purchased, their quantities, rate per unit and amount spend in different units.

Eg.

S.No.	Date	Item	Rate Per Unit	Quantity	Item Rate X Number of Item	Amount
1.	10-02-2015	Milk	20	3 Ltr.	20 × 3	60.00
2.	10-02-2015	Bread	25	1 packet	25 × 1	25.00
3.	10-02-2015	Egg	4	20 Pieces	20 × 4	80.00
4.	10-02-2015	Wheat	28	3 kg	28 × 3	84.00

Following are the various methods to maintain household accounts -

1. **Daily Accounts :** Recording/writing of daily expenditure in a copy or register is called daily accounts. While maintaining daily accounts all details such as – date, items purchased, their quantities, rate per unit and amount spent are recorded in separate columns. At the end of the day the total expenditure is calculated. Maintaining daily accounts provides us a clear cut picture of datewise expenses.

Sample Record of Daily

Date	Items	Quantity	Amount
10/02/2015	Milk	2 ltr.	48.00
10/02/2015	Bread	1 packet	20.00
10/02/2015	Mustard Oil	1 ltr.	80.00
		Total	148.00

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2. **Weekly Expenditure Record :** While maintaining weekly expenditure records, expenses made throughout the week are recorded datewise and at the end of the last day total expenditure is calculated.

Sample Record of Weekly Expenditure

Items	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.	Total Weekly Expenditure
Milk	30	30	30	30	30	30	30	210
Fruit/Veg.	41	-	36	-	-	23	157	257
Groceries	-	329	-	-	-	22	-	351
Snacks	-	36	-	50	-	24	50	160
Clothes	16	-	-	-	-	805	-	821
Electricity Bill	-	-	-	-	1704	-	-	1704
Transport	24	24	24	24	24	200	-	320
Newspaper	-	-	-	-	-	20	-	-
Daily Total	111	419	90	104	1758	1124	237	3843

3. **Monthly Expenditure Record:** While maintaining monthly expenditure records, expenses made every week throughout the month are recorded weekwise and at the end of the last day of last week total expenditure is calculated.

Sample Record of Monthly Expenditure

Items	First Week	Second Week	Third Week	Fourth Week	Total Monthly Expenditure
Milk	210	210	210	210	840
Fruit/Veg.	257	328	180	-	765
Groceries	351	328	180	262	1121
Snacks	105	-	88	-	193
Clothes	821	-	-	44	865
Bills	1704	-	2500	-	4204
Transport	320	150	320	120	910
Magazines	20	-	-	15	35
Weekly Total	3780	1016	3470	651	8933

4. **Cash Book :** Readymade cash books are available in the markets. These can even be made in a register at home also. Each page has two sides. Left side is the credit side and right side is the debit side. On the credit side, details of income from all sources with dates are mentioned. On the debit side datewise detail of expenditure on specific items is to be written. Withdrawals from the bank are written on the debit side while deposits in the bank are written on the credit side. At the end of the page, the total of income and expenditure is being mentioned.

Sample Record of Cash Book

Month : _____   year : _____

Credit			Debit		
Debit	Description	Amt.	Date	Description	Amt.
01/01/2015	Previous month	450	08/01/2014	Petrol	1000
	Balance/Salary		09/01/2014	Groceries	1500
08/01/2015	Salary	4000	09/01/2014	School Fees	400
			12/01/2014	Clothes	300
25/01/2015	Rent	2000	15/01/2014	Bill	300
			16001/2014	Instalment of Car	500
			18/01/2014	Daily Expenses	500
			26/01/2014	Medicines	500
	Total	6450		Total Expenditure	5000
				Saving	1450

Benefits of writing cash book : The main benefit of writing cash book is that a person has complete datewise record of total money spent and balance amount left or due.

Also, there are certain months when expenditure is more due to payment of income tax, insurance policies etc. For this, keeping record of yearly expenditure is helpful. The burden of extra expenditure in a particular month can be lightened by using the savings made in previous months. By keeping these records we can manage our servings.

Points to Remember

1. Family income is the stream of-money, goods and services available to the family.

2. Family income includes Money Income, Real Income (direct and indirect), and Psychic Income.

3. Supplementing family Income means increase in family income from other sources.

4. Supplementing family income is needed for achieving family goals for a safe and secure future, to raise the standard of living, for ensuring savings etc.

5. Family income can be supplemented by increasing the family income or by cutting down the family expenditure.

6. Budget is a tentative estimate of a family's income and expenditure over a fixed period of time.

7. Household accounts can be maintained by daily accounts, weekly and monthly expenditure records, annual expenditures record or by cash book.

Activities

1. Teacher will take the students to the nearest market for daily shopping.

2. Students will learn to make different amount with denomination of coins and notes.

3. Students will make list of things they use at home on daily basis.

4. Students can do more of mock shop and tack shop activities.

Identification of New Indian Currency

Money Calculation

3 ——————— ₹2 **+** ₹1

4 ——————— ₹2 **+** ₹2

6 ——————— ₹5 **+** ₹1

7 ——————— ₹5 **+** ₹2

8 ——————— ₹5 **+** ₹2 **+** ₹1

9 ——————— ₹5 **+** ₹2 **+** ₹2

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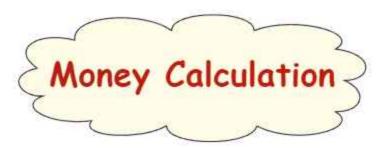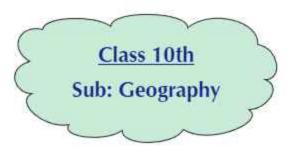
* Use denomination to make correct amount.

Money Calculation

30	—	10 + 10
40	—	20 + 20
60	—	50 + 10
70	—	50 + 20
80	—	50 + 20 + 10
90	—	50 + 20 + 20

Forest and Wildlife Resources

Objectives of the Lesson

1. Students should understand the concept of Biodiversity/Biological diversity

2. Students should be able to differentiate between Flora and Fauna species

3. To understand different species and explain their importance.

4. To unable children to understand causes of environmental distraction and how we can preserve those.

5. To enable children understand the importance of wildlife animals and plants and how those are beneficial for us to cure diseases.

6. To create sensitization regarding animal preservation.

7. To use his/her proficiency in language to explore and study different types of forest and wildlife resources.

General Instructions for teachers

1. Multi sensory model of wildlife should be prepared before taking the class.

2. Create a structured classroom. This may include designating separate areas for group and individual work and centers for reading or art, as well as creating a daily class schedule.

3. Display classroom rules.

4. Post the daily schedule incorporating color.

5. Provide opportunities for purposeful movement.

6. Develop classroom cues for settling down to work, getting out materials, and quieting down.

7. Plan for transition times (between subjects or tasks, before and after lunch, changing classes).

8. Help students organize their materials by using checklists, folders, and containers to keep materials organized in desks.

9. Visually monitor student activity.

Short Discussion of the Lesson

- wildlife preservation - Why is it neccessary, how can we preserve and consequences if not done so.
- Knowledge of endangered species
- How wildlife resources are useful for us
- Brief explanations of various movements.

Dealing with CWSN in an Inclusive Classroom

- Short detail of the Lesson
- VAKT (Visual Auditory Kinesthetic Tactile) Methodology
- Multi-sensory TLM
- Pictorial representation - Charts, PPT's, Projector
- Substitution of difficult words
- Flashcards of different words
- Highlighting the important points
- Asking short questions after every sub-topic.

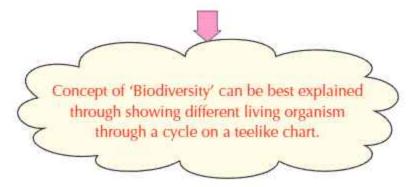Narak! My Lord, you are the creator of music in the world of Lepchas

Oh Narak! My Lord, let me dedicate myself to you

Let me gather your music from the springs, the rivers, the mountains, the forests, the insects and the animals

Let me gather your music from the sweet breeze and offer it to you

Source: Lepcha folk song from northern part of West Bengal.

We share this planet with millions of other living beings, starting from micro-organisms and bacteria, lichens to banyan trees, elephants and blue whales. This entire habitat that we live in has immense biodiversity. We humans along with all living organisms form a complex web of ecological system in which we are only a part and very much dependent on this system for our own existence. For example, the plants, animals and micro-organisms re-create the quality of the air we breathe, the water we drink and the soil that produces our food without which we cannot survive. Forests play a key role in the ecological system as these are also the primary producers on which all other living beings depend.

Concept of 'Biodiversity' can be best explained through showing different living organism through a cycle on a teelike chart.

Biodiversity or Biological Diversity is immensely rich in wildlife and cultivated species, diverse in form and function but closely integrated in a system through multiple network of interdependencies.

Activity

To elaborate the concept of 'Flora and Fauna' school garden can be used as a medium to explore

1. Make a scrap book of 10 floral Fauna spiced.

2. Group discussion to be followed by creating flow charts give different topics to groups of 4-5 students.

Flora and Fauna in India

If you look around, you will be able to find that there are some animals and plants which are unique in your area. In fact, India is one of the world's richest countries in terms of its vast array of biological diversity, and has nearly 8 per cent of the total number of species in the world (estimated to be 1.6 million). This is possibly twice or thrice the number yet to be discovered. You have already studied in detail about the extent and variety of forest and wildlife resources in India. You may have realised the importance of these resources in our daily life. These diverse flora and fauna are so well integrated in our daily life that we take these for granted. But, lately, they are under great stress mainy due to insensitivity to our environment.

Do you know?

Over 81,000 species of fauna and 47,000 species of flora are found in this country so far? Of the estimated 47,000 plant species, about 15,000 flowering species are endemic (indigenous) to India.

Find out stories prevalent in your region which are about the harmonious relationship between human beings and nature.

Some estimates suggest that at least 10 per cent of India's recorded wild flora and 20 per cent of its mammals are on the threatened list. Many of these would now be categorised as 'critical', that is on the verge of extinction like the cheetah, pink-headed duck, mountain quail, forest spotted owlet, and plants like madhuca insignis (a wild 2015-16 variety of mahua) and hubbardia heptaneuron,(a species of grass). In fact, no one can say how many species may have already been lost. Today, we only talk of the larger and more visible animals and plants that have become extinct but what about smaller animals like insects and plants?
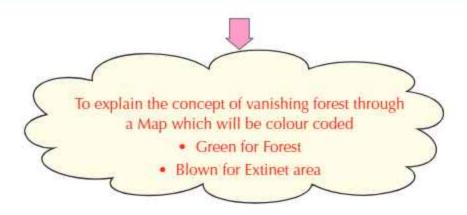
Activity

Explaining the importance and usefulness of plants and animals, how we can preserve them. This can be done through Flow Chart which can be prepared by student.

Do you know?

Do you know that among the larger animals in India, 79 species of mammals, 44 of birds, 15 of reptiles, and 3 of amphibians are threatened? Nearly 1,500 plant species are considered endangered. Flowering plants and vertebrate animals have recently become extinct at a rate estimated to be 50 to 100 times the average expected natural rate.

To explain the concept of vanishing forest through a Map which will be colour coded
- Green for Forest
- Blown for Extinet area

Vanishing Forests

The dimensions of deforestation in India are staggering. The forest and tree cover in the country is estimated at 78.92 million hectare, which is 24.01 per cent of the total geographical area (dense forest 12.24 per cent; open forest 8.99 per cent; and mangrove 0.14 per cent). According to the State of Forest Report (2013), the dense forest cover has increased by 10,098 sq km since 1997. However, this apparent increase in the forest cover is due to plantation by different agencies. The State of Forest Report does not differentiate between natural forests and plantations. Therefore, these reports fail to deliver accurate information about actual loss of natural forests.
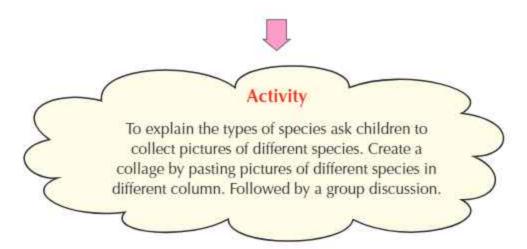
Let us now understand the different categories of existing plants and animal species. Based on the International Union for Conservation of Nature and Natural Resources (IUCN), we can classify as follows –

Figure 2.1

Normal Species: Species whose population levels are considered to be normal for their survival, such as cattle, sal, pine, rodents, etc.

Activity

To explain the types of species ask children to collect pictures of different species. Create a collage by pasting pictures of different species in different column. Followed by a group discussion.

Endangered Species: These are species which are in danger of extinction. The survival of such species is difficult if the negative factors that have led to a decline in their population continue to operate. The examples of such species are black buck, crocodile, Indian wild ass, Indian rhino, lion tailed macaque, sangai (brow anter deer in Manipur), etc.

Vulnerable Species: These are species whose population has declined to levels from where it is likely to move into the endangered category in the near future if the negative factors continue to operate. The examples of such species are blue sheep, Asiatic elephant, Gangetic dolphin, etc.

Rare Species: Species with small population may move into the endangered or vulnerable category if the negative factors affecting them continue to operate. The examples of such species are the Himalayan brown bear, wild Asiatic buffalo, desert fox and hornbill, etc.

Endemic Species: These are species which are only found in some particular areas usually isolated by natural or geographical barriers. Examples of such species are the Andaman teal, Nicobar pigeon, Andaman wild pig, mithun in Arunchal Pradesh.

Extinct Species: These are species which are not found after searches of known or likely areas where they may occur. A species may be extinct from a local area, region, country, continent or the entire earth. Examples of such species are the Asiatic cheetah, pink head duck.

Figure 2.2: A few extinct, rate and endangered species

Asiatic Cheetah: where did they go?

The world's fastest land mammal, the cheetah (Acinonyx jubantus), is a unique and specialised member of the cat family and can move at the speed of 112 km./hr. The cheetah is often mistaken for a leopard. Its distinguishing marks are the long teardropshaped lines on each side of the nose from the corner of its eyes to its mouth. Prior to the 20th century, cheetahs were widely distributed throughout Africa and Asia. Today, the Asian cheetah is nearly extinct due to a decline of available habitat and prey. The species was declared extinct in India long back in 1952.

What are the negative factors that cause such fearful depletion of the flora and fauna?

If you look around, you will be able to find out how we have transformed nature into a resource obtaining directly and indirectly from the forests and

wildlife – wood, barks, leaves, rubber, medicines, dyes, food, fuel, fodder, manure, etc. So it is we ourselves who have depleted our forests and wildlife. The greatest damage inflicted on Indian forests was during the colonial period due to the expansion of the railways, agriculture, commercial and scientific forestry and mining activities. Even after Independence, agricultural expansion continues to be one of the major causes of depletion of forest resources. Between 1951 and 1980, according to the Forest Survey of India, over 26,200 sq. km. of forest area was converted into agricultural land all over India. Substantial parts of the tribal belts, especially in the northeastern and central India, have been deforested or degraded by shifting cultivation (jhum), a type of 'slash and burn' agriculture.

Are colonial forest policies to be blamed?

Some of our environmental activists say that the promotion of a few favoured species, in many parts of India, has been carried through the ironically-termed "enrichment plantation", in which a single commercially valuable species was extensively planted and other species eliminated. For instance, teak monoculture has damaged the natural forest in South India and Chir Pine (Pinus roxburghii) plantations in the Himalayas have replaced the Himalayan oak (Quercius spp.) and Rhododendron forests.

Large-scale development projects have also contributed significantly to the loss of forests. Since 1951, over 5,000 sq km of forest was cleared for river valley projects. Clearing of forests is still continuing with projects like the Narmada Sagar Project in Madhya Pradesh, which would inundate 40,000 hectares of forest. Mining is another important factor behind deforestation. The Buxa Tiger Reserve in West Bengal is seriously threatened by the ongoing dolomite mining. It has disturbed the natural habitat of many species and blocked the migration route of several others, including the great Indian elephant.

Elaborate different factors leading to extinction of forest through pictorial description on black/while board.

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Tribal girls using bamboo saplings in a nursery at Mukhali near Slient Valley

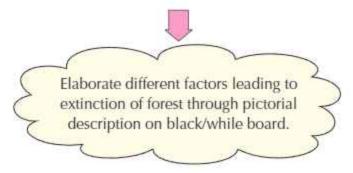Tribal women selling minor forest produce   Leaf litter collection by women folk

Figure 2.3

Many foresters and environmentalists hold the view that the greatest degrading factors behind the depletion of forest resources are grazing and fuel-wood collection. Though, there may be some substance in their argument, yet, the fact remains that a substantial part of the fuel-fodder demand is met by lopping rather than by felling entire trees. The forest ecosystems are repositories of some of the country's most valuable forest products, minerals and other resources that meet the demands of the rapidly expanding industrialurban economy. These protected areas, thus mean different things to different people, and therein lies the fertile ground for conflicts.

Adaptation / Activity

Two charts will be displayed to describe causes of environmental destruction through visual simulation Dramatisation of Environmental Distruction, students will play different ropes of factors leading to Environmental Distruction.

The Himalayan Yew in trouble

The Himalayan Yew (Taxus wallachiana) is a medicinal plant found in various parts of Himachal Pradesh and Arunachal Pradesh. A chemical compound called 'taxol' is extracted from the bark, needles, twigs and roots of this tree, and it has been successfully used to treat some cancers – the drug is now the biggest selling anti-cancer drug in the world. The species is under great threat due to over-exploitation. In the last one decade, thousands of yew trees have dried up in various parts of Himachal Pradesh and Arunachal Pradesh.

Habitat destruction, hunting, poaching, over-exploitation, environmental pollution, poisoning and forest fires are factors, which have led to the decline in India's biodiversity. Other important causes of environmental destruction are unequal access, inequitable consumption of resources and differential sharing of responsibility for environmental well-being. Over-population in third world countries is often cited as the cause of environmental degradation. However, an average American consumes 40 times more resources than an average Somalian. Similarly, the richest five per cent of Indian society probably cause more ecological damage because of the amount they consume than the poorest 25 per cent. The former shares minimum responsibilities for environmental well-being. The question is: who is consuming what, from where and how much?

Do you know?

Do you know that over half of India's natural forests are gone, one-third of its wetlands drained out, 70 per cent of its surface water bodies polluted, 40 per cent of its mangroves wiped out, and with continued hunting and trade of wild animals and commercially valuable plants, thousands of plant and animal species are heading towards extinction?

> **Activity**
>
> Have you noticed any activity which leads to the loss of biodiversity around you? Write a note on it and suggest some measures to prevent it.
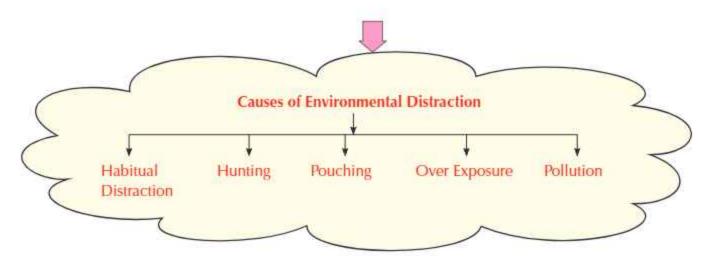
The destruction of forests and wildlife is not just a biological issue. The biological loss is strongly correlated with the loss of cultural diversity. Such losses have increasingly marginalised and impoverished many indigenous and other forest-dependent communities, who directly depend on various components of the forest and wildlife for food, drink, medicine, culture, spirituality, etc. Within the poor, women are affected more than men. In many societies, women bear the major responsibility of collection of fuel, fodder, water and other basic subsistence needs. As these resources are depleted, the drudgery of women increases and sometimes they have to walk for more than 10 km to collect these resources. This causes serious health problems for women and negligence of home and children because of the increased hours of work, which often has serious social implications. The indirect impact of degradation such as severe drought or deforestation-induced floods, etc. also hits the poor the hardest. Poverty in these cases is a direct outcome of environmental destruction. Therefore, forest and wildlife, are vital to the quality of life and environment in the subcontinent. It is imperative to adapt to sound forest and wildlife conservation strategies.

Conservation of Forest and Wildlife in India

Conservation in the background of rapid decline in wildlife population and forestry has become essential. But why do we need to conserve our forests and wildlife? Conservation preserves the ecological diversity and our life support systems – water, air and soil. It also preserves the genetic diversity of plants and animals for better growth of species and breeding. For example, in agriculture, we are still dependent on traditional crop varieties. Fisheries too are heavily dependent on the maintenance of aquatic biodiversity.

In the 1960s and 1970s, conservationists demanded a national wildlife protection programme. The Indian Wildlife (Protection) Act was implemented in 1972, with various provisions for protecting habitats. An all-India list of protected species was also published. The thrust of the programme was towards protecting the remaining population of certain endangered species by banning hunting, giving legal protection to their

Causes of Environmental Distraction

Habitual Distraction | Hunting | Pouching | Over Exposure | Pollution

habitats, and restricting trade in wildlife. Subsequently, central and many state governments established national parks and wildlife sanctuaries about which you have already studied. The central government also announced several projects for protecting specific animals, which were gravely threatened, including the tiger, the one-horned rhinoceros, the Kashmir stag or hangul, three types of crocodiles – fresh water crocodile, saltwater crocodile and the Gharial, the Asiatic lion, and others. Most recently, the Indian elephant, black buck (chinkara), the great Indian bustard (godawan) and the snow leopard, etc. have been given full or partial legal protection against hunting and trade throughout India.

Project Tiger

Tiger is one of the key wildlife species in the faunal web. In 1973, the authorities realised that the tiger population had dwindled to 1,827 from an estimated 55,000 at the turn of the century. The major threats to tiger

Figure 2.4: Rhino and deer in Kaziranga National Park

population are numerous, such as poaching for trade, shrinking habitat, depletion of prey base species, growing human population, etc. The trade of tiger skins and the use of their bones in traditional medicines, especially in the Asian countries left the tiger population on the verge of extinction. Since India and Nepal provide habitat to about two-thirds of the surviving tiger population in the world, these two nations became prime targets for poaching and illegal trading.

"Project Tiger", one of the wellpublicised wildlife campaigns in the world, was launched in 1973. Initially, it showed success as the tiger population went up to 4,002 in 1985 and 4,334 in 1989. But in 1993, the population of the tiger had dropped to 3,600. There were 39 tiger reserves in India covering an area of 32137.14 sq km* Tiger conservation has been viewed not only as an effort to save an endangered species, but with equal importance as a means of preserving biotypes of sizeable magnitude. Corbett National Park in Uttarakhand, Sunderbans National Park in West Bengal, Bandhavgarh National Park in Madhya Pradesh, Sariska Wildlife Sanctuary in Rajasthan, Manas Tiger Reserve in Assam and Periyar Tiger Reserve in Kerala are some of the tiger reserves of India.

Gharial on the brink

The gharial population has been at its lowest since the 1970s. What went wrong and what can we do?

ROMULUS WHITAKER and **JANAKI LENIN**

Bird deaths blamed on dirty Yamuna
Delhi Govt Report Points To Toxic Elements in Stagnant Water

CRITICALLY ENDANGERED: Captive gharial at the Madras

Can you find out the reasons for the above mentioned problems?

The conservation projects are now focusing on biodiversity rather than on a few of its components. There is now a more intensive search for different conservation measures. Increasingly, even insects are beginning to find a place in conservation planning. In the notification under Wildlife Act of 1980 and 1986, several hundred butterflies, moths, beetles, and one dragonfly have been added to the list of protected species. In 1991, for the first time plants were also added to the list, starting with six species.

Activity

Collect more information on the wildlife sanctuaries and national parks of India and cite their locations on the map of India.

Types and Distribution of Forest and Wildlife Resources

Even if we want to conserve our vast forest and wildlife resources, it is rather difficult to manage, control and regulate them. In India, much of its forest and wildlife resources are either owned or managed by the government through the Forest Department or other government departments. These are classified under the following categories.

(i) *Reserved Forests:* More than half of the total forest land has been declared reserved forests. Reserved forests are regarded as the most valuable as far as the conservation of forest and wildlife resources are concerned.

(ii) *Protected Forests:* Almost one-third of the total forest area is protected forest, as declared by the Forest Department. This forest land are protected from any further depletion.

(iii) *Unclassed Forests:* These are other forests and wastelands belonging to both government and private individuals and communities.

Reserved and protected forests are also referred to as permanent forest estates maintained for the purpose of producing timber and other forest produce, and for protective reasons. Madhya Pradesh has the largest area under permanent forests, constituting 75 per cent of its total forest area. Jammu and Kashmir, Andhra Pradesh, Uttarakhand, Kerala, Tamil Nadu, West Bengal, and Maharashtra have large percentages of reserved forests of its total forest area whereas Bihar, Haryana, Punjab, Himachal Pradesh, Odisha and Rajasthan have a bulk of it under protected forests. All Northeastern states and parts of Gujarat have a very high percentage of their forests as unclassed forests managed by local communities.

Adaptation

Elaborate different kind of forest and wildlife resources through a tactile model.

How researches are being polluted can be explained through an utility

- Smelling fresh blower and state food - Air pollution
- Showing cleaning and contaminated water in 2 glasses - water pollution.
- Noisy and peaceful classes - Noise pollution.
- Clean soil and soil with non-biodegradable waste soil pollution.

Community and Conservation

Conservation strategies are not new in our country. We often ignore that in India, forests are also home to some of the traditional communities. In some areas of India, local communities are struggling to conserve these habitats along with government officials, recognising that only this will secure their own long-term livelihood. In Sariska Tiger Reserve, Rajasthan, villagers have fought against mining by citing the Wildlife Protection Act. In many areas, villagers themselves are protecting habitats and explicitly rejecting government involvement. The inhabitants of five villages in the Alwar district of Rajasthan have declared 1,200 hectares of forest as the Bhairodev Dakav 'Sonchuri', declaring their own set of rules and regulations which do not allow hunting, and are protecting the wildlife against any outside encroachments.

Sacred groves - a wealth of diverse and rare species

Nature worship is an age old tribal belief based on the premise that all creations of nature have to be protected. Such beliefs have preserved several virgin forests in pristine form called Sacred Groves (the forests of God and Goddesses). These patches of forest or parts of large forests have been left untouched by the local people and any interference with them is banned.

Certain societies revere a particular tree which they have preserved from time immemorial. The Mundas and the Santhal of Chota Nagpur region worship mahua (Bassia latifolia) and kadamba (Anthocaphalus cadamba) trees, and the tribals of Odisha and Bihar worship the tamarind (Tamarindus indica) and mango (Mangifera indica) trees during weddings. To many of us, peepal and banyan trees are considered sacred.

Indian society comprises several cultures, each with its own set of traditional methods of conserving nature and its creations. Sacred qualities are often ascribed to springs, mountain peaks, plants and animals which are closely protected. You will find troops of macaques and langurs around many temples. They are fed daily and treated as a part of temple devotees. In and around Bishnoi villages in Rajasthan, herds of blackbuck, (chinkara), nilgai and peacocks can be seen as an integral part of the community and nobody harms them.

Activity

Write a short essay on any practices which you may have observed and practised in your everyday lives that conserve and protect the environment around you.

The famous Chipko movement in the Himalayas has not only successfully resisted deforestation in several areas but has also shown that community afforestation with indigenous species can be enormously successful. Attempts to revive the traditional conservation methods or developing new methods of ecological farming are now widespread. Farmers and citizen's groups like the Beej Bachao Andolan in Tehri and Navdanya have shown that adequate levels of diversified crop production without the use of synthetic chemicals are possible and economically viable.

In India joint forest management (JFM) programme furnishes a good example for involving local communities in the management and restoration of degraded forests. The programme has been in formal existence since 1988 when the state of Odisha passed the first resolution for joint forest management. JFM depends on the formation of local (village) institutions that undertake protection activities mostly on degraded forest land managed by the forest department. In return, the members of these communities are entitled to intermediary benefits like non-timber forest produces and share in the timber harvested by 'successful protection'.

The clear lesson from the dynamics of both environmental destruction and reconstruction in India is that local communities everywhere have to be involved in some kind of natural resource management. But there is still a long way to go before local communities are at the centre-stage in decision-making. Accept only those economic or developmental activities, that are people centric, environment-friendly and economically rewarding.

"The tree is a peculiar organism of unlimited kindness and benevolence and makes no demand for its sustenance, and extends generously the products of its life activity. It affords protection to all beings, offering shade even to the axemen who destroy it".

<div align="right">

Gautama Buddha (487 B.C.)

</div>

Exercises Exercises Exercises Exercises Exercises

1. Multiple choice questions.

   (i) Which of these statements is not a valid reason for the depletion of flora and fauna?

      (a) Agricultural expansion.

      (b) Large scale developmental projects.

      (c) Grazing and fuel wood collection.

      (d) Rapid industrialisation and urbanisation.

   (ii) Which of the following conservation strategies do not directly involve community participation?

      (a) Joint forest management

      (b) Beej Bachao Andolan

      (c) Chipko Movement

      (d) Demarcation of Wildlife sanctuaries

2. Match the following animals with their category of existence.

Category of existence	Category of existence
Black buck	Extinct
Asiatic elephant	Rare
Andaman wild pig	Endangered
Himalayan brown bear	Vulnerable
Pink head duck	Endemic

3. Match the following.

Reserved forests	other forests and wastelands belonging to both government and private individuals and communities
Protected forests	forests are regarded as most valuable as far as the conservation of forest and wildlife resources
Unclassed forests	forest lands are protected from any further depletion

4. Answer the following questions in about 30 words.

    (i)   What is biodiversity? Why is biodiversity important for human lives?

    (ii) How have human activities affected the depletion of flora and fauna? Explain.

5. Answer the following questions in about 120 words.

    (i)   Describe how communities have conserved and protected forests and wildlife in India?

    (ii) Write a note on good practices towards conserving forest and wildlife.

Home Work

*   Field Trip to Zoological park.
*   Scarp book of wildlife world.
*   Vocabulary book of
    −   Word related to forest.
    −   Wildlife resources.
*   Article collection
    −   Extinct forest.
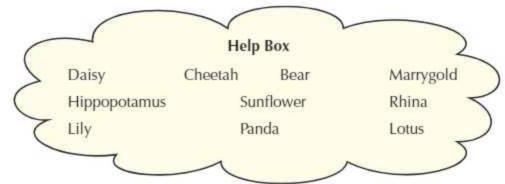   −   Endangered species.
*   Map
    Mark the places full of wildlife resources
    E.g. Assam oil, Sundorban - Honey, Arunachal Pradesh - Oochids

Work Sheet

1.

Help Box

Daisy	Cheetah	Bear	Marrygold
Hippopotamus		Sunflower	Rhina
Lily		Panda	Lotus
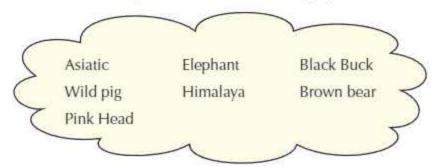
Flora	Flora
1.	1.
2.	2.
3.	3.
4.	4.

2. Write the following animals with their category of existence

Asiatic	Elephant	Black Buck
Wild pig	Himalaya	Brown bear
Pink Head		
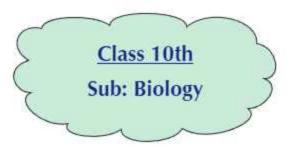
Endangered	Vulnerable	Endemic	Rare	Extinct

3. Fill in the blanks and complete the definition of the following

   .... are other forest and .... belonging to government and .... individuals and communities.

   .... forests are regarded as most .... as far as the .... of forests and .... resources.

   .... forest lands are .... firm any further ....

4. Collect different types of Leaves, Grasses, branches, creaper, Flowers. Tell the children to categorise them and make a chart.

5. Collect pictures of plants having medicinal values.

Life Processes

How do we tell the difference between what is alive and what is not alive? If we see a dog running, or a cow chewing cud, or a man shouting loudly on the street, we know that these are living beings. What if the dog or the cow or the man were asleep? We would still think that they were alive, but how did we know that? We see them breathing, and we know that they are alive. What about plants? How do we know that they are alive? We see them green, some of us will say. But what about plants that have leaves of colours other than green? They grow over time, so we know that they are alive, some will say. In other words, we tend to think of some sort of movement, either growth-related or not, as common evidence for being alive. But a plant that is not visibly growing is still alive, and some animals can breathe without visible movement. So using visible movement as the defining characteristic of life is not enough.

To explain the concept of 'Life Processes' we can give examples of hiving and non-hiving things and furthers explain how a body mechanism functions even when our body immobile.

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Activity

Role play one student in moving and another in sleeping position. Teacher can explain how body mechanism are functioning in both the students prescriptive of this mobility.

Movements over very small scales will be invisible to the naked eye – movements of molecules, for example. Is this invisible molecular movement necessary for life? If we ask this question to professional biologists, they will say yes. In fact, viruses do not show any molecular movement in them (until they infect some cell), and that is partly why there is a controversy about whether they are truly alive or not.

Why are molecular movements needed for life? We have seen in earlier classes that living organisms are well-organised structures; they can have tissues, tissues have cells, cells have smaller components in them, and so on. Because of the effects of the environment, this organised, ordered nature of living structures is very likely to keep breaking down over time. If order breaks down, the organism will no longer be alive. So living creatures must keep repairing and maintaining their structures. Since all these structures are made up of molecules, they must move molecules around all the time.

What are the maintenance processes in living organisms? Let us explore.

6.1 What are Life Processes?

The maintenance functions of living organisms must go on even when they are not doing anything particular. Even when we are just sitting in class, even if we are just asleep, this maintenance job has to go on. The processes which together perform this maintenance job are life processes.

Since these maintenance processes are needed to prevent damage and break-down, energy is needed for them. This energy comes from outside the body of the individual organism. So there must be a process to transfer a source of energy from outside the body of the organism, which we call food, to the inside, a process we commonly call nutrition. If the body size of the organisms is to grow, additional raw material will also be needed from outside. Since life on earth depends on carbonbased molecules, most of these food sources are also carbon-based. Depending on the complexity

of these carbon sources, different organisms can then use different kinds of nutritional processes.

The outside sources of energy could be quite varied, since the environment is not under the control of the individual organism. These sources of energy, therefore, need to be broken down or built up in the body, and must be finally converted to a uniform source of energy that can be used for the various molecular movements needed for maintaining living structures, as well as to the kind of molecules the body needs to grow. For this, a series of chemical reactions in the body are necessary. Oxidising-reducing reactions are some of the most common chemical means to break-down molecules. For this, many organisms use oxygen sourced from outside the body. The process of acquiring oxygen from outside the body, and to use it in the process of break-down of food sources for cellular needs, is what we call respiration.

In the case of a single-celled organism, no specific organs for taking in food, exchange of gases or removal of wastes may be needed because the entire surface of the organism is in contact with the environment. But what happens when the body size of the organism increases and the body design becomes more complex? In multi-cellular organisms, all the cells may not be in direct contact with the surrounding environment. Thus, simple diffusion will not meet the requirements of all the cells.

We have seen previously how, in multi-cellular organisms, various body parts have specialised in the functions they perform. We are familiar with the idea of these specialised tissues, and with their organisation in the body of the organism. It is therefore not surprising that the uptake of food and of oxygen will also be the function of specialised tissues. However, this poses a problem, since the food and oxygen are now taken up at one place in the body of the organisms, while all parts of the body need them. This situation creates a need for a transportation system for carrying food and oxygen from one place to another in the body.

When chemical reactions use the carbon source and the oxygen for energy generation, they create by-products that are not only useless for the cells of the body, but could even be harmful. These waste byproducts are therefore needed to be removed from the body and discarded outside by a process called excretion. Again, if the basic rules for body design in multi-cellular organisms are followed, a specialised tissue for excretion will be developed, which means that the transportation system will need to transport waste away from cells to this excretory tissue.

Let us consider these various processes, so essential to maintain life, one by one.

"For visual learners like children with (ASD) visually appealing diagrams of flow charts etc. should be incorporated as and when possible for e.g. simple diffusion. Different unicellular of multicellular organisms."

6.2 Nutrition

When we walk or ride a bicycle, we are using up energy. Even when we are not doing any apparent activity, energy is needed to maintain a state of order in our body. We also need materials from outside in order to grow, develop, synthesise protein and other substances needed in the body. This source of energy and materials is the food we eat.

How do living things get their food?

The general requirement for energy and materials is common in all organisms, but it is fulfilled in different ways. Some organisms use simple food material obtained from inorganic sources in the form of carbon dioxide and water. These organisms, the autotrophs, include green plants and some bacteria. Other organisms utilise complex substances. These complex substances have to be broken down into simpler ones before they can be used for the upkeep and growth of the body. To achieve this, organisms use of multimedia to explain how enzymes speed up a reaction without being used up called enzymes. Thus, the heterotrophs survival depends directly or indirectly on autotrophs. Heterotrophic organisms include animals and fungi.

Teachers can describe that we need energy to perform physical and mental activities through a pictorial representation.

6.2.1 Autotrophic Nutrition

Carbon and energy requirements of the autotrophic organism are fulfilled by photosynthesis. It is the process by which autotrophs take in substances from the outside and convert them into stored forms of energy. This material is taken in the form of carbon dioxide and water which is converted into carbohydrates in the presence of sunlight and chlorophyll. Carbohydrates are utilised for providing energy to the plant. We will study how this takes place in the next section. The carbohydrates which are not used immediately are stored in the form of starch, which serves as the internal energy reserve to be used as and when required by the plant. A somewhat similar situation is seen in us where some of the energy derived from the food we eat is stored in our body in the form of glycogen.

$$6CO_2 + 6H_2O \xrightarrow[\text{Sunlight}]{\text{Chlorophyll}} C_6H_{12}O_6 + 6O_2$$

Let us now see what actually happens during the process of photosynthesis. The following events occur during this process –

(i)   Absorption of light energy by chlorophyll.

(ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.

(iii) Reduction of carbon dioxide to carbohydrates.
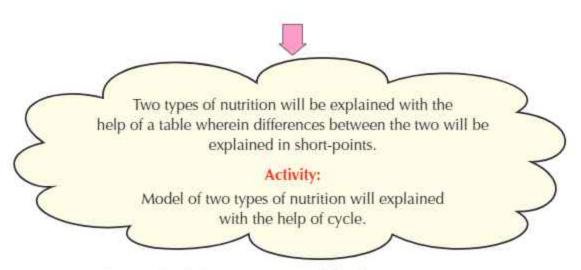
Class-room Activity

Photosynthesis can be best explained through role-play. Teacher will creat a role play situation where two different situation will be displayed. A healthy plant getting sun, water, air, fertilizers will be shown. In another situation a dry plant getting no nutrition will be shown.

These steps need not take place one after the other immediately. For example, desert plants take up carbon dioxide at night and prepare an intermediate which is acted upon by the energy absorbed by the chlorophyll during the day.

Two types of nutrition will be explained with the help of a table wherein differences between the two will be explained in short-points.

Activity:

Model of two types of nutrition will explained with the help of cycle.

Let us see how each of the components of the above reaction are necessary for photosynthesis.

If you carefully observe a cross-section of a leaf under the microscope (shown in Fig. 6.1), you will notice that some cells contain green dots. These green dots are cell organelles called chloroplasts which contain chlorophyll. Let us do an activity which demonstrates that chlorophyll is essential for photosynthesis.
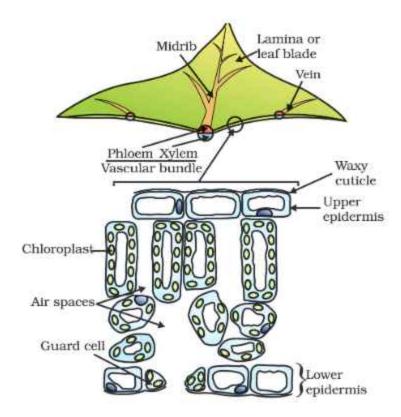

Figure 6.1: Cross-section of a leaf

Activity 6.1

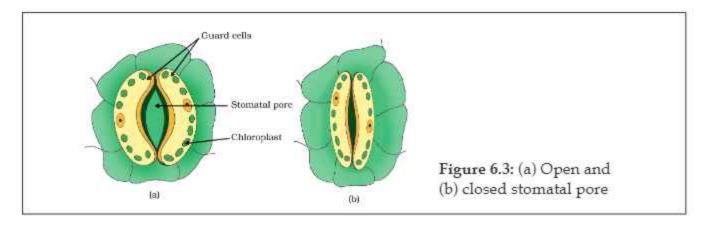Take a potted plant with variegated leaves – for example, money plant or crotons.

- Keep the plant in a dark room for three days so that all the starch gets used up.
- Now keep the plant in sunlight for about six hours.
- Pluck a leaf from the plant. Mark the green areas in it and trace them on a sheet of paper.
- Dip the leaf in boiling water for a few minutes.
- After this, immerse it in a beaker containing alcohol.
- Carefully place the above beaker in a water-bath and heat till the alcohol begins to boil.
- What happens to the colour of the leaf? What is the colour of the solution?
- Now dip the leaf in a dilute solution of iodine for a few minutes.
- Take out the leaf and rinse off the iodine solution.
- Observe the colour of the leaf and compare this with the tracing of the leaf done in the beginning (Fig. 6.2).
- What can you conclude about the presence of starch in various areas of the leaf?

(a)   (b)

Figure 6.2: Variegated leaf (a) before and (b) after starch test

Now, let us study how the plant obtains carbon dioxide. In Class IX, we had talked about stomata (Fig. 6.3) which are tiny pores present on the surface of the leaves. Massive amounts of gaseous exchange takes place in the leaves through these pores for the purpose of photosynthesis. But it is important to note here that exchange of gases occurs across the surface of stems, roots and leaves as well. Since large amounts of water can also be lost through these stomata, the plant closes these pores when it does

Teacher will demonstrate and explain how green and fresh leaf floats in water and the dried leaf rather the bottom due to the effect of photosynthesis by demonstrating the activity.

Figure 6.3: (a) Open and (b) closed stomatal pore

not need carbon dioxide for photosynthesis. The opening and closing of the pore is a function of the guard cells. The guard cells swell when water flows into them, causing the stomatal pore to open. Similarly the pore closes if the guard cells shrink.

"An arrangement of two red kidney beans placed opposite to each other can be shown to make the concept of stomata pore clear."

Activity 6.2

- Take two healthy potted plants which are nearly the same size.

- Keep them in a dark room for three days.

- Now place each plant on separate glass plates. Place a watch-glass containing potassium hydroxide by the side of one of the plants. The potassium hydroxide is used to absorb carbon dioxide.

- Cover both plants with separate bell-jars as shown in Fig. 6.4.

- Use vaseline to seal the bottom of the jars to the glass plates so that the set-up is air-tight.

- Keep the plants in sunlight for about two hours.

- Pluck a leaf from each plant and check for the presence of starch as in the above activity.

- Do both the leaves show the presence of the same amount of starch?

- What can you conclude from this activity?

Based on the two activities performed above, can we design an experiment to demonstrate that sunlight is essential for photosynthesis?

So far, we have talked about how autotrophs meet their energy requirements. But they also need other raw materials for building their body. Water used in photosynthesis is taken up from the soil by the roots in

Figure 6.4: Experimental set-up
(a) with potassium hudroxide
(b) without potassium hydroxide

Bell jar

Watch-glass containing potassium hydroxide

(a)

(b)

terrestrial plants. Other materials like nitrogen, phosphorus, iron and magnesium are taken up from the soil. Nitrogen is an essential element used in the synthesis of proteins and other compounds. This is taken up in the form of inorganic nitrates or nitrites. Or it is taken up as organic compounds which have been prepared by bacteria from atmospheric nitrogen.

Photosynthesis Teaching activities

1. Why do leaves change colour in the fall? Experiment for kids.

2. Photosynthesis is a process where plants use .... from the sun to convert .... from the air and .... from the soil into .... to feed the plant and .... is given out in the air.

Clue words: water, sugar, carbon dioxide, light, oxygen

3. Students will visually show the process of photosynthesis and explain it as a recipe. We can draw a leaf and pretend it is speaking and saying

    *   My name is Larry the Leaf.

    *   I take in sunlight.

    *   I drink lots of water.

    *   I breathe in carbon dioxide.

    *   I make my own food called grocose which is sugar.

    *   I breathe out oxygen to help humans.

4. Poem on Photosynthesis can be read in class

> Plants need food, but cant take it;
>
> instead they have to bake it,
>
> in the leaves you cannot see,
>
> the CHLOROPLASTS so tiny
>
> making food for energy
>
> and here is their recipe.
>
> SUNLIGHT, CARBON DIOXIDE, WATER
>
> When its finally done,
>
> there is SUGAR and OXYGEN
>
> from WATER, AIR & SUN
>
> That Photosynthesis

5. Take students out of the class and let them feel various kinds of plants and leaves. Some are fresh, others are dry. Few on the tree and others fallen. Talk to them about it, and let them have a practical feel of it.

6. Play a quiz game with students where all the questions focus on photosynthesis divide students into two teams reward one point for each correct answer a team gives. You can also do a race for the correct answer. The first team that answers correctly receives two points. Any connect answer receives one point.

6.2.2 Heterotrophic Nutrition

Each organism is adapted to its environment. The form of nutrition differs depending on the type and availability of food material as well as how it is obtained by the organism. For example, whether the food source is stationary (such as grass) or mobile (such as a deer), would allow for differences in how the food is accessed and what is the nutritive apparatus used by a cow and a lion. There is a range of strategies by which the food is taken in and used by the organism. Some organisms break-down the food material outside the body and then absorb it. Examples are fungi like bread moulds, yeast and mushrooms. Others take in whole material and break it
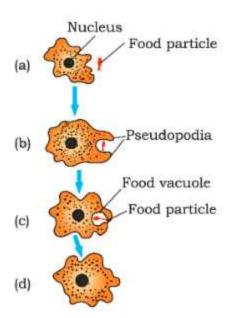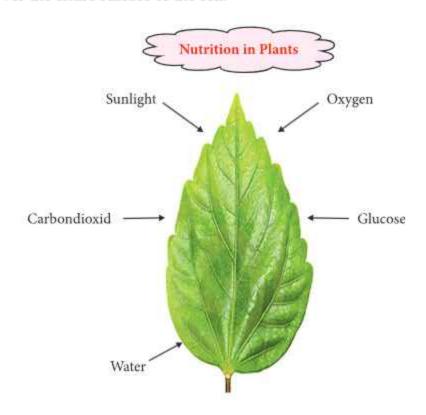
Figure 6.5: Nutrition in Amoeba

down inside their bodies. What can be taken in and broken down depends on the body design and functioning. Some other organisms derive nutrition from plants or animals without killing them. This parasitic nutritive strategy is used by a wide variety of organisms like cuscuta (amarbel), ticks, lice, leeches and tape-worms.

6.2.3 How do Organisms obtain their Nutrition?

Since the food and the way it is obtained differ, the digestive system is different in various organisms. In single-celled organisms, the food may be taken in by the entire surface. But as the complexity of the organism increases, different parts become specialised to perform different functions. For example, Amoeba takes in food using temporary finger-like extensions of the cell surface which fuse over the food particle forming a food-vacuole (Fig. 6.5). Inside the foodvacuole, complex substances are broken down into simpler ones which then diffuse into the cytoplasm. The remaining undigested material is moved to the surface of the cell and thrown out. In *Paramoecium*, which is also a unicellular organism, the cell has a definite shape and food s taken in at a specific spot. Food is moved to this spot by the movement of cilia which cover the entire surface of the cell.

6.2.4 Nutrition in Human Beings

The alimentary canal is basically a long tube extending from the mouth to the anus. In Fig. 6.6, we can see that the tube has different parts. Various regions are specialised to perform different functions. What happens to the food once it enters our body? We shall discuss this process here.

Activity 6.3

- Take 1 mL starch solution (1%) in two test tubes (A and B).
- Add 1 mL saliva to test tube A and leave both test tubes undisturbed for 20-30 minutes.
- Now add a few drops of dilute iodine solution to the test tubes.
- In which test tube do you observe a colour change?
- What does this indicate about the presence or absence of starch in the two test tubes?
- What does this tell us about the action of saliva on starch?

We eat various types of food which has to pass through the same digestive tract. Naturally the food has to be processed to generate particles which are small and of the same texture. This is achieved by crushing the food with our teeth. Since the lining of the canal is soft, the food is also wetted to make its passage smooth. When we eat something we like, our mouth 'waters'. This is actually not only water, but a fluid called saliva secreted by the salivary glands. Another aspect of the food we ingest is its complex nature. If it is to be absorbed from the alimentary canal, it has to be broken into smaller molecules. This is done with the help of biological catalysts called enzymes. The saliva contains an enzyme called salivary 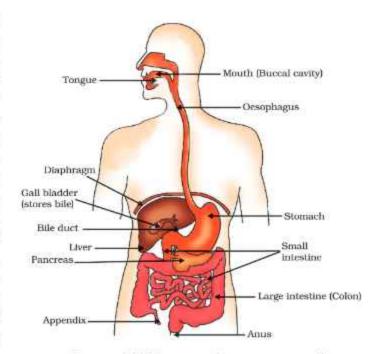amylase that breaks down starch which is a complex molecule to give sugar. The food is mixed thoroughly with saliva and moved around the mouth while chewing by the muscular tongue.

Figure 6.6: Human alimentary canal

Nutrition in human being

My Plate

It is necessary to move the food in a regulated manner along the digestive tube so that it can be processed properly in each part. The lining of canal has muscles that contract rhythmically in order to push the food forward. These peristaltic movements occur all along the gut.

From the mouth, the food is taken to the stomach through the food-pipe or oesophagus. The stomach is a large organ which expands when food enters it. The muscular walls of the stomach help in mixing the food thoroughly with more digestive juices.

These digestion functions are taken care of by the gastric glands present in the wall of the stomach. These release hydrochloric acid, a protein digesting enzyme called pepsin, and mucus. The hydrochloric acid creates an acidic medium which facilitates the action of the enzyme pepsin. What other function do you think is served by the acid? The mucus protects the inner lining of the stomach from the action of the acid under normal conditions. We have often heard adults complaining about 'acidity'. Can this be related to what has been discussed above?

The exit of food from the stomach is regulated by a sphincter muscle which releases it in small amounts into the small intestine. From the stomach, the food now enters the small intestine. This is the longest part of the alimentary canal which is fitted into a compact space because of extensive coiling.

The length of the small intestine differs in various animals depending on the food they eat. Herbivores eating grass need a longer small intestine to allow the cellulose to be digested. Meat is easier to digest, hence carnivores like tigers have a shorter small intestine.

The small intestine is the site of the complete digestion of carbohydrates, proteins and fats. It receives the secretions of the liver and pancreas for this purpose. The food coming from the stomach is acidic and has to be made alkaline for the pancreatic enzymes to act. Bile juice from the liver accomplishes this in addition to acting on fats. Fats are present in the intestine in the form of large globules which makes it difficult for enzymes to act on them. Bile salts break them down into smaller globules increasing the efficiency of enzyme action. This is similar to the emulsifying action of soaps on dirt that we have learnt about in Chapter 4. The pancreas secretes pancreatic juice which contains enzymes like trypsin for digesting proteins and lipase for breaking down emulsified fats. The walls of the small intestine contain glands which secrete intestinal juice. The enzymes present in it finally convert the proteins to amino acids, complex carbohydrates into glucose and fats into fatty acids and glycerol.

The digested food is taken up by the walls of the intestine. The inner lining of the small intestine has numerous finger-like projections called villi which increase the surface area for absorption. The villi are richly supplied with blood vessels which take the absorbed food to each and every cell of the body, where it is utilised for obtaining energy, building up new tissues and the repair of old tissues.

The unabsorbed food is sent into the large intestine where more villi absorb water from this material. The rest of the material is removed from the body via the anus. The exit of this waste material is regulated by the anal sphincter.

"It can also be demonstrated through an activity using a socks and a ball to show how food is propelled forward."

MORE TO KNOWN?

Dental Caries

Dental caries or tooth decay causes gradual softening of enamel and dentine. It begins when bacteria acting on sugars produce acids that softens or demineralises the enamel. Masses of bacterial cells together with food particles stick to the teeth to form dental plaque. Saliva cannot reach the tooth surface to neutralise the acid as plaque covers the teeth. Brushing the teeth after eating removes the plaque before the bacteria produce acids. If untreated, microorganisms may invade the pulp, causing inflammation and infection.

QUESTIONS

1. What are the differences between autotrophic nutrition and heterotrophic nutrition?

2. Where do plants get each of the raw materials required for photosynthesis?

3. What is the role of the acid in our stomach?

4. What is the function of digestive enzymes?

5. How is the small intestine designed to absorb digested food?

6.3 Respiration

Activity 6.4

- Take some freshly prepared lime water in a test tube.

- Blow air through this lime water.

- Note how long it takes for the lime water to turn milky.

- Use a syringe or *pichkari* to pass air through some fresh lime water taken in another test tube (Fig. 6.7).

- Note how long it takes for this lime water to turn milky.

- What does this tell us about the amount of carbon dioxide in the air that we breathe out?

Activity 6.5

- Take some fruit juice or sugar solution and add some yeast to this. Take this mixture in a test tube fitted with a one-holed cork.

- Fit the cork with a bent glass tube. Dip the free end of the glass tube into a test tube containing freshly prepared lime water.

- What change is observed in the lime water and how long does it take for this change to occur?

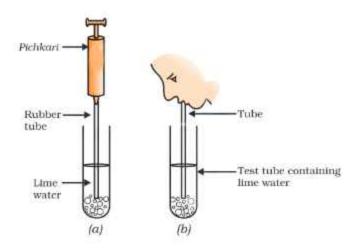- What does this tell us about the products of fermentation?

Figure 6.7: (a) Air being passed into lime water with a pichkari/syringe, (b) air being exhalted into lime water

We have discussed nutrition in organisms in the last section. The food material taken in during the process of nutrition is used in cells to provide energy for various life processes. Diverse organisms do this in different ways – some use oxygen to break-down glucose completely into carbon dioxide and water, some use other pathways that do not involve oxygen (Fig. 6.8). In all cases, the first step is the break-down of glucose, a six-carbon molecule, into a three-carbon molecule called pyruvate. This process takes place in the cytoplasm. Further, the pyruvate may be converted into ethanol and carbon dioxide. This process takes place in yeast during fermentation. Since this process takes place in the absence of air (oxygen), it is called anaerobic respiration. Breakdown of pyruvate using oxygen takes place in the mitochondria. This process breaks up the three-carbon pyruvate molecule to give three molecules of carbon dioxide. The other product is water. Since this process takes place in the presence of air (oxygen), it is
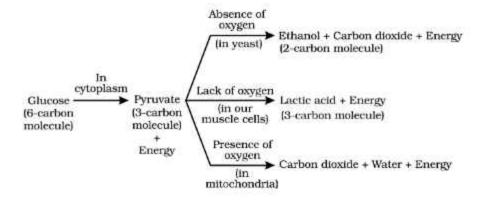
Figure 6.8: Break-down of glucose by various pathways

called aerobic respiration. The release of energy in this aerobic process is a lot greater than in the anaerobic process. Sometimes, when there is a lack of oxygen in our muscle cells, another pathway for the break-down of pyruvate is taken. Here the pyruvate is converted into lactic acid which is also a three-carbon molecule. This build-up of lactic acid in our muscles during sudden activity causes cramps.

The energy released during cellular respiration is immediately used to synthesise a molecule called ATP which is used to fuel all other activities in the cell. In these processes, ATP is broken down giving rise to a fixed amount of energy which can drive the endothermic reactions taking place in the cell.

The Little Girl

Principles to Use with English-Language Learners who have learning difficulties

The two common errors that should be avoided for English-language learners with learning difficulties are

i.   Lengthy whole-class lectures devoid of visual aids or active student participation

ii. Lengthy student seatwork

Key instructional principles apply to English-language learners who have learning difficulties:

1. **Vocabulary instruction** is very important for English-language development and can really increase content-area learning. Vocabulary instruction does not mean memorizing the definitions of 20 new vocabulary terms each lesson. It refers to a range of instructional strategies that can be used to help English-language learners with learning difficulties acquire vocabulary. Such strategies include:

    i.   Learning vocabulary in the context of mastering new concepts through literature discussions

    ii. Student conversations

    iii.   Writing exercises

    iv.   Cooperative group activities

    v.   Semantic maps

For example, as in any subject area, knowing a word involves a complex process of constructing relationships between ideas, terms, and contexts, rather than to simply know the spelling or pronunciation for a list of terms. Constructing these relationships is complicated by the fact that terms often cannot be translated into another language, or do not exist in a comparable language form such as questioning or analyzing. In other words, some languages may use metaphors in contrast to analysis forms, such as local words (samosa), to express.

Use of students' native language can be an excellent means of supporting students' learning of concepts, even if the teacher does not speak the students' native language. A student's native language use can be respected and fostered through the availability of books and other materials in the student's native language. The availability of other individuals, who speak that language, including teaching assistants, parents, local high school or university students, and peers, is also helpful.

Consistent language use is very important, especially early in second-language learning. Teachers should be particularly thoughtful and consistent in the way they use language in the classroom. For example, synonyms, metaphors, similes, and idioms should be used carefully and purposefully. Verbal checks for student comprehension should be done frequently.

Teachers should also monitor their pace of introducing language concepts. For example, many fourth-grade teachers of native English speakers may see their role as one of providing models of the richness of the English language. The teachers will therefore use synonyms and metaphors as a means of demonstrating that richness. This same approach can be disastrous for English-language learners with learning difficulties, depending on their level of English proficiency.

One general rule of thumb is to be extremely careful and consistent in language use when presenting a new concept, and to use synonyms, similes, and metaphors primarily when expanding on or reviewing a concept. As students learn more English, the pace can increase, but this depends on the complexity of the content and other factors.

Using clear, consistent language does not mean using childish language. Teachers can effectively use quite sophisticated terms such as "character clue" and "migration" with English-language learners with learning

difficulties. However, these terms should be visually displayed and clearly defined, with relevant examples provided.

Many students with academic difficulties receive additional services from a variety of support programs. For example, it is not uncommon for students with academic difficulties to receive language and academic support in regular education programs such as ESL, Title I, or Migrant Tutorial and, if eligible, in special education programs for students with learning disabilities or speech and language impairments. Unless there is a high degree of coordination between these programs, the issue of consistent language use may be compromised, and instruction may in fact be less comprehensible than it might otherwise be.

Opportunities to speak and use language in a fashion that is linked to academic learning constitute one of the most critical indicators of student academic engagement. Opportunities can involve paraphrasing, asking questions, and expressing ideas, and include speaking in both English and the native language.

Principles of cognitive science suggest that we learn by doing and receiving feedback on what we do. English-language learners with learning difficulties learn language (and how to use it) by verbalizing and receiving feedback.

Peers can be excellent mediators in helping to bridge language gaps between classroom teachers and English-language learners with learning difficulties. In essence, they can serve as unofficial teacher assistants. It is important to provide peers (and other helpers) with careful supervision and structure from the teacher. Close teacher supervision and direction help maximize the benefit to both the English-language learner and the peer mediator.

In an effort to speed up the process of learning English, some teachers and administrators do not allow students to use their native language when working with other students of the same language background. Yet, peer clarification in the native language can be extremely beneficial.

A "one size fits all" approach to classroom discussions can be problematic for a number of reasons. Each culture has its own conventions. These conventions can relate to the amount of talking that is considered appropriate during a lesson, the meaning of direct eye contact, and the volume of speech, to name just three of many potentially important examples. Some of the basic information about key cultural conventions can be learned through conversations with members of the community.

Visual aids are an excellent way to help English-language learners with learning difficulties process information. The double demands of learning

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content and a second language are significant. Because the spoken word is fleeting, visual aids such as graphic organizers, concept and story maps, and word banks give students visual tools to process, reflect on, and organize information.

Ongoing assessment of the effectiveness of instructional activities in producing actual student learning is important in ensuring that teaching methods are effective. Teachers can and should frequently assess the effects of instructional activities for all students through an array of measures. Ongoing curriculum-based assessments are a widely advocated approach to measuring both English-language development and academic/cognitive growth. This approach can often be administered in the students' native language and/or in English, depending on the purpose of the assessment.

Informal instructional assessments during the lesson are also an excellent way to probe and track, in a number of ways, what the students are getting out of lessons, discussions, practice, independent work, partner learning, or cooperative groups. These curriculum-based and informal assessments show teachers clearly what is being learned, so that they can provide responsive feedback and adjust teaching tactics.

Building home-school connections has been noted as an important way to encourage English-language development. Parent involvement can be encouraged by making school a welcoming place for all parents. This can be accomplished by posting bilingual signs where possible, sending home bilingual notices and letters, and setting up situations where parents feel comfortable volunteering in the schools. Certainly, parents can help on field trips, and they can be invited to share their expertise in the classrooms.

The gap between home and school can be bridged, in part, through appropriate homework assignments. Be aware that many students have no one at home who can help them with homework assignments in English. It might be useful to provide writing or reading assignments that can be done in either language. Include explanations to parents regarding the nature of homework in the family's primary language. English-language learners with learning difficulties can also read a book they know well in English to their parents, even if the parents have limited English-language capabilities. This creates an opportunity for children to teach their parents English and to show their parents what they have learned.

Objectives

- to enable students to work together in a group and assess the students.
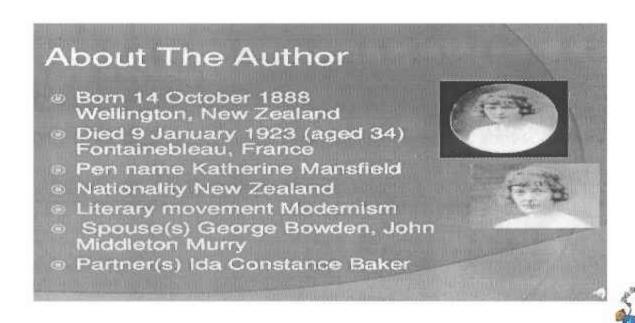
- to enable students to organize their thoughts after a group discussion

- to encourage students to participate and speak in English during the role play

- to assess the students speaking ability.

- to understand character from the point of view of another student

- to enhance listening skills of students

- To enable the students to identify words used in describing Kezia and her father;

- to enable students to look at sets of words which are related in some way;

- to enable the students to understand characterization of Kezia and her father;

- to enable students to enhance their writing skills;

- to enable students to think imaginatively and creatively

Teacher Preparation

Flash cards of all the word meaning given in the NCERT textbook as well the ones given in the boxes below.

http://www.slideshare.net/NVSBPL/9-the-little-girl

About The Author

- Born 14 October 1888 Wellington, New Zealand
- Died 9 January 1923 (aged 34) Fontainebleau, France
- Pen name Katherine Mansfield
- Nationality New Zealand
- Literary movement Modernism
- Spouse(s) George Bowden, John Middleton Murry
- Partner(s) Ida Constance Baker

Text

To the little girl he was a figure to be feared and avoided. Every morning before going to business he came into the nursery and gave her a *casual* kiss, to which she responded with "Good-bye, father." And oh, the glad sense of relief when she heard the noise of the *carriage* growing fainter and *fainter* down the long road!

In the evening, leaning over the staircase at his home-coming, she heard his loud voice in the hall. "Bring my tea into the smoking-room ... Hasn't the paper come yet? Have they taken it into the kitchen again? Mother, go and see if my paper's out there — and bring me my slippers."

carriage - vehicle/ buggy	fainter - lighter
casual - relaxed and unconcerned	
staircase - space where stairs go up	

"Kezia," mother would call to her, "if you're a good girl you can come down and take off father's boots." Slowly the girl would slip down the stairs, holding tightly to the staircase with one hand — more slowly still, across the hall, and push open the smoking-room door.

By that time he had his spectacles on and looked at her over them in a way that was terrifying to the little girl.

"Well, Kezia, get a move on and pull off these boots and take them outside.

Been a good girl today?"

"I d-d-don't know, father."

"You d-d-don't know? If you stutter like that mother will have to take you to the doctor."

frightening - cause to feel extreme fear

slipped - to lose one's footing and slide unintentionally for a short distance

She never stuttered with other people — had quite given it up — but only with father, because then she was trying so hard to say the words properly. "What's the matter? What are you looking so wretched about? Mother, I wish you would teach this child not to appear on the brink of suicide ... Here, Kezia, carry my teacup back to the table — carefully; your hands jog

like an old lady's. And try to keep your handkerchief in your pocket, not up your sleeve."

"Y-y-yes, father."

On Sundays she sat in the same pew with him in church, listening while he sang in a loud, clear voice, watching while he made little notes during the sermon with the stump of a blue pencil on the back of an envelope — his eyes narrowed to a slit — one hand beating a silent tattoo on the pew ledge. He said his prayers so loudly she was certain God heard him above the clergyman.

He was so big — his hands and his neck, especially his mouth when he yawned. Thinking about him alone in the nursery was like thinking about a giant.

> stutter - talk with continued involuntary repetition of sounds
>
> yawned - involuntarily open one's mouth wide open and inhale deeply due to tiredness or boredom
>
> wretched - a very unhappy or unfortunate state

On Sunday afternoons grandmother sent her down to the drawing-room, dressed in her brown velvet, to have a "nice talk with father and mother." But the little girl always found mother reading The Sketch and father stretched out on the couch, his handkerchief on his face, his feet propped on one of the best sofa pillows, and so soundly sleeping that he snored.

She, perched on the piano-stool, gravely watched him until he woke and stretched, and asked the time — then looked at her.

"Don't stare so, Kezia. You look like a little brown owl."

One day, when she was kept indoors with a cold, the grandmother told her that father's birthday was next week, and suggested she should make him a pincushion for a present out of a beautiful piece of yellow silk.

> Stirred - move or cause to move slightly
>
> Sighed - emit a long, deep audible breath expressing sadness, relief, tiredness

Laboriously, with a double cotton, the little girl stitched three sides. But what to fill it with? That was the question. The grandmother was out in the garden, and she wandered into mother's bedroom to look for "scraps." On the bed table she discovered a great many sheets of fine paper, gathered them up, shredded them into tiny pieces, and stuffed her case, then sewed up the fourth side.

That night there was a hue and cry over the house. Father's great speech for the Port Authority had been lost. Rooms were ransacked — servants questioned. Finally mother came into the nursery.

"Kezia, I suppose you didn't see some papers on a table in our room?" "Oh, yes," she said. "I tore them up for my s'prise." "What!" screamed mother. "Come straight down to the dining-room this instant."

> sewed - making stitches with a needle and thread or a sewing machine
>
> laborious - hardwork

And she was dragged down to where father was pacing to and fro, hands behind his back.

"Well?" he said sharply.

Mother explained.

He stopped and stared in a stupefied manner at the child.

"Did you do that?"

"N-n-no," she whispered.

"Mother, go up to the nursery and fetch down the damned thing — see that the child's put to bed this instant."

> whispered - speak very softly using one's breath
>
> drag-pull someone/something forcefully, roughly

Crying too much to explain, she lay in the shadowed room watching the evening light sift through the Venetian blinds and trace a sad little pattern on the floor.

Then father came into the room with a ruler in his hands.

"I am going to whip you for this," he said.

"Oh, no, no!" she screamed, cowering down under the bedclothes.

He pulled them aside.

"Sit up," he commanded, "and hold out your hands. You must be taught once and for all not to touch what does not belong to you."

"But it was for your b-b-birthday."

Down came the ruler on her little, pink palms.

Hours later, when the grandmother had wrapped her in a shawl and rocked her in the rocking-chair the child cuddled close to her soft body.

"What did Jesus make fathers for?" she sobbed.

"Here's a clean hanky, darling, with some of my lavender water on it. Go to sleep, pet; you'll forget all about it in the morning. I tried to explain to father, but he was too upset to listen to-night."

But the child never forgot. Next time she saw him she whipped both hands behind her back, and a red colour flew into her cheeks.

> wrapped - cover in soft material
>
> cling - stick
>
> sob - cry noisily

The Macdonalds lived in the next-door house. Five children there were. Looking through a hole in the vegetable garden fence the little girl saw them playing "tag" in the evening. The father with the baby Mac on his shoulders, two little girls hanging on to his coat tails, ran round and round the flower beds, shaking with laughter. Once she saw the boys turn the hose on him — turn the hose on him — and he made a great grab at them, tickling them until they got hiccoughs. Then it was she decided there were different sorts of fathers.

Suddenly, one day, mother became ill, and she and grandmother drove into town in a closed carriage.

The little girl was left alone in the house with Alice, the "general." That was all right in the daytime, but while Alice was putting her to bed she grew suddenly afraid.

> fence - railing of wood or wire
>
> sort - kind

"What'll I do if I have nightmare?" she asked. "I often have nightmare, and then grannie takes me into her bed — I can't stay in the dark — it all gets 'whispery.'... What'll I do if I do?"

"You just go to sleep, child," said Alice, pulling off her socks and whacking them against the bedrail, "and don't you holler out and wake your poor pa." But the same old nightmare came — the butcher with a knife and a rope who grew nearer and nearer, smiling that dreadful smile, while she could not move, could only stand still, crying out, "Grandma, Grandma!" She woke shivering, to see father beside her bed, a candle in his hand. "What's the matter?" he said.

> butcher - a person who cuts and sells meat
>
> nightmare - a terrible dream   scream - cry in fear

"Oh, a butcher — a knife — I want grannie." He blew out the candle, bent down and caught up the child in his arms, carrying her along the passage to the big bedroom. A newspaper was on the bed — a half-smoked cigar balanced against his reading-lamp. He pitched the paper on the floor, threw the cigar into the fireplace, then carefully tucked up the child. He lay down beside her. Half asleep still, still with the butcher's smile all about her, it seemed, she crept close to him, snuggled her head under his arm, held tightly to his pyjama jacket.

Then the dark did not matter; she lay still. "Here, rub your feet against my legs and get them warm," said father.

> snuggled - move or settle into a warm comfortable position
>
> blew out - put outpassage - corridor

Tired out, he slept before the little girl. A funny feeling came over her. Poor father! Not so big, after all — and with no one to look after him ... He was harder than the grandmother, but it was a nice hardness ... And every day he had to work and was too tired to be a Mr. Macdonald ... She had torn up all his beautiful writing ... She stirred suddenly, and sighed. "What's the matter?" asked father. "Another dream?" "Oh," said the little girl, "my head's on your heart; I can hear it going. What a big heart you've got, father dear."

https://www.youtube.corn/watch?v=E-BhudQALKU
Solved answers to the questions of the lesson in the above link

Activity 1

(This task is to be done after completing the whole lesson.)

To evolve a 5 minute role play with dialogues in a group of 10

> **Situation 1 for the role play.(5 min)** A 10 year old student in the family misunderstanding one elderly family member, could be grandparents, parents elder brothers or sisters, aunts or uncles. The student is very afraid of that family member and always thinks negatively about that member.
>
> **Situation 2 for the role play.(5 min)** The student comes to realize that the elderly family member loves and cares about the student and his/her thoughts and his/her impressions are falsely based.

Procedure

Divide the class into groups of 10

Explain the task as written above by citing an example

Give some time for group discussion and allow the class to come up with a lively discussion

Facilitate and move around the class keeping strict supervision and identifying and grading students on their performance in group discussion.

Start the role play one by one of each group.

After the performance of each group there should be a discussion initiated by the teacher keeping the checklist points and taking regular opinion poll of the class.

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Assessment Criteria

Checklist for Group Discussion/ Role play

1	Does the student live up to the role assigned to him during a role-oriented discussion?	Yes / No
2	Does the student take initiative?	
3	Does the student have content knowledge?	
4	How well does the student put forth his views?	
5	Does he/she show respect to the peer group?	
6	Does he/she have proper communication skills?	
7	Does he/she show sensitivity towards environment?	
8	Does he/she exhibit proper body language while interacting and acting	
9	Does he/she raise relevant points?	
10	Does he/she give fair chance to others' for their views?	
11	Does he/she exhibit confidence level?	

Activity 2

Task: Short writing task of 80 words each

    a.   Characterization of Kezia

    b.   Characterization of Kezia's father

Procedure

Write the following inventory of words on the board in which are words mixed describing Kezia and her father. (additional describing words can be used by the teachers to make the test more effective)

List of words - affectionate, short-tempered, loving, strict, hardworking, undemonstrative, frightened, unsure, responsible, timid, stammering, disciplinarian, caring, nervous, intimidating, judgmental

Tell the students to look at the inventory and make two balloons in their notebook with names of Kezia and her father in the centre and write the words associated with each around the balloon. For ex;

Now ask each student to write the a character sketch of both Kezia and her father using the words identified above and citing only one example each from the lesson to support their write-up. It should not exceed 80 words.

KEZIA   FATHER

Assessment Criteria

Checklist for the Writing Task

1	Has the student exhibited enough content knowledge?	Yes / No
2	Has he/she written relevant points?	Yes / No
3	Does he/she use words reflected in the given inventory appropriately?	Yes / No
4	Does he/she use correct grammar and tense formation?	Yes / No
5	Does he/she use correct spellings?	Yes / No
6	Does the work show his/her understanding of the concept?	Yes / No
7	Does the work reflect clear organization?	Yes / No
8	Does he/she present systematic presentation of ideas with a beginning, middle and end?	Yes / No
9	Does the student use proper punctuation?	Yes / No
10	Does the student use legible handwriting?	Yes / No

https://www.youtube.com/watch?v=E-BhudOALKU

Chapter 7

Other Issues
of Concern

Bullying

Objectives

By the end of the session the students will be able to

- Identify bullying behavior
- Examine and express ways to handle bullying
- Understand methods to stop bullying in school and social environments
- Think of ways to handle bullying
- Enhance their coping skills to deal with bullying
- Help the bully to understand his weakness

Activity

1. Establish a Safe Space. Start the conversation with students by letting them know that they will be discussing some sensitive topics in class today. Ask them to brainstorm a list of guidelines for the class discussion. Some examples may include confidentiality, respect, and one person speaking at a time. Write the student's responses on the board.

This activity is about forming groups. Start by clearing a space large enough to move around. The idea is to form different groups of people as quickly as possible when the teacher calls out a common interest. For example, if the teacher says "find people with the same colour shirt as you" students would group themselves by shirt colour. Make groups. Ask the students to ask and respond to the following questions in order to keep everyone involved.

    a.   What is your favourite colour?

    b.   What is your favourite candy?

    c.   What kind of pet would you like to have?

    d.   What do you usually do right after school?

    e.   What colour shoes are you wearing today?

    f.   How many people are there in your family?

    g.   What is your favourite school subject?

    h.   What is your least favourite school subject?

2. Handout 3×5 cards and ask the students to **write answers** to the following questions. Make sure that they do not share their responses with others until later.

    a.   What wouldn't we know by just looking at you?

    b.   What is your favourite book?

    c.   What goal are you working towards?

    d.   What is your most positive personality trait?

    e.   What personal experiences do you have, if any, with discrimination?

3. Collect the cards. Shuffle the cards and pass them out randomly, ensuring that no one has their own card. Ask the students to find the owner of the card based on the answers.

Discussion Questions

    a.   How accurate were the assumptions you made about people you don't know very well?

    b.   Did you learn anything about your classmates that surprised you?

    c.   What are the dangers of making assumptions?

    d.   What is a stereotype?

    e.   How can assumptions about groups lead to stereotypes?

    f.   What can we do to prevent stereotyping?

4. Again divide the students up into different groups. Once everyone is seated with a new group, pose the following questions and ask students to engage in a small-group discussion in which each student has the chance to share an experience with the group:

   a. Have you seen examples of biased based incidents based on someone's:

      – Race?

      – Religion?

      – Language?

   b. Sexual Orientation?

   c. Gender expression?

   d. Family status?

   e. Why do you think this happens?

   f. Can you remember a time when you were called a name or put down for being different from others around you?

   g. How did it feel?

   h. What did you do?

Give groups some time to share their experiences.

5. The teacher will now ask the students to look at the following pictures carefully and then discuss the following questions

   1. What do you see in the cuttings and displays?

   2. How safe do you feel at school? (Safe means feeling comfortable, relaxed, and not worried that someone could harm you).

   3. Who do you talk to when you have problems at school?

   4. Have you been bullied by other students ... (Bullying meaning, a repeated act, or continuous act of one of the following?)

1. *Physically?*

   Examples: hit, pushed, shoved, slapped, kicked, spit at, or beaten up, had property stolen

2. *Verbally?*

   Examples: called names, teased hurtfully, insulted, humiliated, threatened

3. *Socially?*

   Examples: excluded from a group, made to look dumb by someone, gossiped about; rumours spread

FIGHTING THE MENACE

GUIDELINES ISSUED BY CBSE

- School prospectus must declare bullying is strictly prohibited; any such act will be punished
- Each school to have an anti-bullying committee with vice principal, a senior teacher, school doctor, counsellor, PTA representative, school management representative, legal representative & peer educators as its members
- A counsellor each for primary, middle, secondary & senior secondary sections
- Students to be sensitized about respecting privacy and dignity of others
- Role of parents to be reinforced in parent teacher meetings
- Curriculum for teacher training courses to include topics on sensitization & prevention of bullying
- Schools may keep a complaint/suggestion box & monitor the feedback
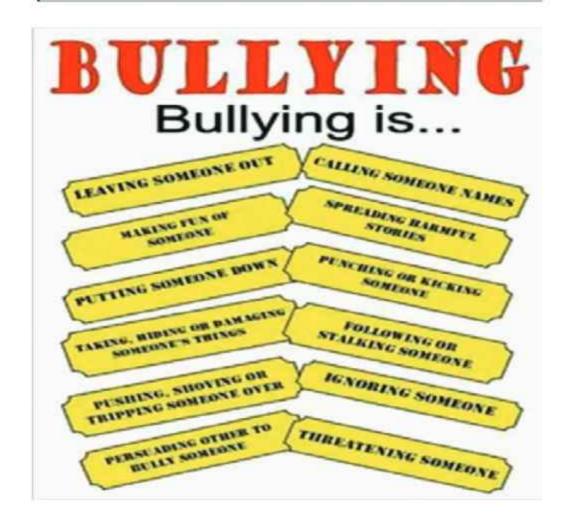
WHAT'S BULLYING

1 **Direct:** Through physical intimidation or attacks, verbal abuse, unwanted attention and advances, damaging property

2 **Indirect:** Spreading malicious rumours

3 **Cyber-bullying:** Sending unpleasant SMSs, photographs or emails, to victim or others

PROMINENT CASES

- **Aug 2014:** Son of a Bihar minister found unconscious in his hostel room at a public residential school in Gwalior. 14-year-old's family alleged he was bullied and beaten up by his seniors
- **Mar 2014:** A mobile video shows Class VI students of a south Delhi public school hitting a Class VII student
- **Aug 2013:** A student in Park Street, Kolkata, forced to drink urine by three classmates as punishment for quitting their 'gang'

BULLYING
Bullying is...

- LEAVING SOMEONE OUT
- CALLING SOMEONE NAMES
- MAKING FUN OF SOMEONE
- SPREADING HARMFUL STORIES
- PUTTING SOMEONE DOWN
- PUNCHING OR KICKING SOMEONE
- TAKING, HIDING OR DAMAGING SOMEONE'S THINGS
- FOLLOWING OR STALKING SOMEONE
- PUSHING, SHOVING OR TRIPPING SOMEONE OVER
- IGNORING SOMEONE
- PERSUADING OTHER TO BULLY SOMEONE
- THREATENING SOMEONE

IS YOUR CHILD BEING BULLIED?

Sudden changes in behaviour and mood are often the only signs that a child is being bullied. If your child shows some of the following signs, ask if someone is bullying them.

Indicators that he/she is being bullied

- Doesn't want to go to school
- Grades slip suddenly
- Is distressed and anxious
- Appetite changes, eats little or too much
- Becomes quieter, withdrawn, unconfident
- Cries himself to sleep, has nightmares
- Asks for money or starts stealing (to pay bullies)
- Tends to lose things frequently (bullies take things)
- Has unexplained bruises, cuts, scratches
- Begins to bully other children or siblings
- Become aggressive

Is your child the problem?

- Trouble paying attention and concentrating
- Disruptive in class
- Doing badly at school
- Gets into fights frequently
- Reacts to teasing or criticism with extreme anger
- Is unsocial
- Hangs out with aggressive children
- Is defiant
- Is insensitive to others feelings
- Cruel to pets and other animals
- Gets frustrated easily

What parents should do?

- Take bullying seriously. It won't go away on its own. Don't dismiss it as over-reaction on your child's part.
- Ask the child if others are harassing them unnecessary, excluding them from activities or starting malicious rumours about them
- Inform the school immediately and follow-up to find out what they have done to stop the bullying
- Ask them to avoid getting aggressive, fighting back. The problem gets bigger if you or your child lose your cool and hit back

4. *Electronically?*

   Examples: threatened, embarrassed, singled out, had your feelings hurt, been gossiped about, or had secrets about you revealed through e-mail or phone text messages or pictures

5. *Racially?*

   Examples: treated differently or badly because of your race, culture, ethnic

6. *Gender?*

   Examples: left out or treated badly because you are a boy or a girl; heard sexist comments

Discussion by the teacher

Bullying: This is when a person deliberately hurts another person, in a way that is unfair and the action is repeated over time. It is an aggressive behaviour that is intentional and involves an imbalance of power and strength

Verbal bullying: This is when a person says hurtful things to another person. These remarks usually take the form of insults; swear words and judgments that are personal and mean.

Examples of verbal bullying:

- Hurtful name-calling
- Persistent teasing
- Gossiping
- Racist remarks
- Threatening another person
- Verbal bullying can be scary and could lead to you not wanting to go to school. It is important to make sure that this does not happen, so you need to speak out and tell an adult what is happening.

Emotional bullying: This is when a person deliberately tries to humiliate and exclude another person.

Examples of emotional bullying:

- Humiliating another person
- Blackmailing them
- Attacking someone's personality
- Manipulating friendships
- Excluding someone from activities
- Peer pressure
- Spreading rumours

Everyone wants to be accepted, so being excluded and humiliated is really hurtful and very difficult to deal with on your own.

Physical bullying: This is when one or more people physically hurt another person Examples of physical bullying:

- Punching
- Poking
- Strangling
- Hair-pulling
- Beating
- Biting
- Kicking
- Pinching
- Damaging or stealing someone else's property

Physical bullying can easily get out of hand. Victims of physical abuse can get really hurt and in severe instances get killed. Physical bullying must be stopped! When they cannot fight back

Sexual Bullying

Sexual bullying: This includes many of the above-mentioned aspects of bullying, but is focused on your private parts. This includes talking about and commenting on these private parts.

Examples of sexual bullying:

- Inappropriate sexual contact, such as pinching buttock.
- Inappropriate talk about private parts of the body.

Cyber bullying

This means bullying over the social media networks, by sms or email.

Examples of cyber bullying:

- Setting up a hate group on a social network.
- Posting offensive pictures.
- Sending text messages with rude, inappropriate or racist comments.

6. Now draw the class together and ask students to share any connections they see between the various stories their classmates told. Record the similarities that come up on the board for students to refer to in the next portion of the lesson. Challenge students to use the experiences they just shared about their individual experiences with being called names for being different, and the similarities they found among their stories to generate a group discussion. Let students know they will be discussing their experiences and as a group, developing simple ways to stay SAFE when name-calling or bullying occurs. Ask students to be honest when expressing their feelings and experiences with name-calling and bullying, and to show respect to other students. Ask the students to share their experiences with the larger group. Lead the students in a discussion using the following questions:

How did it feel to be called a name or put down for being different?

Did you know **how** to end the situation?

What was it like working in groups today with people that were both similar to and different from you?

How do our differences help us do good work?

What can you do when you are being called names or bullied? Let students come up with their own ideas before presenting them with the SAFE guidelines. Provide the students with the No Name-Calling Week Pledge and the Staying SAFE Guidelines. Ask the students to sign the pledge, agreeing to end name-calling and bullying. Review the Staying SAFE guidelines with the students. If you are being called names or bullied,

Remember the four ways to stay **SAFE**:

Say what you Feel:

Tell the person who is bullying you or calling you names the way their actions make you feel.

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Ask for Help: Sometimes you can't handle the situation yourself, and it's ok to ask for help. Find a teacher or other school staff member to talk to

Find a Friend: Hanging out with people who make you feel good about yourself is important, and the person calling you names might think twice before picking on you when you're with your friends.

Exit the Area: While it may feel like you aren't doing anything at all, sometimes walking away from someone who is picking on you is the best way to end things.

NO NAME CALLING PLEDGE

I, _____ believe that bullying and calling others hurtful names is wrong. I pledge to do my best to:

- Not bully others of all them hurtful names.
- Intervene, if I safely can, in situations when students are being called names.
- Support efforts to end bullying and name-calling.

Why do some kids bully other kids?

There are many reasons why kids behave in this way. Some of these reasons could be:

- They like to have power and control over others,
- They don't like sharing or taking turns.
- They might be being bullied themselves - either at home or at school.
- They are angry or stressed and don't know how to deal with this.
- They feel bad about themselves for some reason.
- They might be exposed to violence at home.

Whatever the reason, there is no excuse to bully other people. Nobody likes a bully and they have no true friends.

References

http://www.educationworld.eom/a special/bully.shtml

http://www.pbs.org/newshour/extra/lessons plans/bullyinq-education-resources/

http://bullyproofclassroom.com/great-anti-bullving-activities

https://www.stopbullying.gov/at-risk/groups/special-needs/BullvinqTipSheet.pdf

Teaching Gender Equity at Secondary Level

"He can't have a doll, he's a boy!" "Girls can't be firemen!" "You're not a boy. You have long hair!" Our attitudes about gender develop very early. Studies show that by age two children begin to notice physical differences and by age three they have developed ideas about behaviors, activities, etc., that go with a particular gender. Gender equity is social order in which women and men share the same opportunities and the same constraints on full participation in both economic and domestic realm.

Gender inequality pervades the world. And women with disabilities face significantly more difficulties - in both public and private spheres - in attaining access to adequate housing, health, education, vocational training and employment, and are more likely to be institutionalized. They also experience inequality in gaining employment, promotion rates and pay for equal work, access to training and retraining, credit and other productive resources, and rarely participate in economic decision-making. Women and girls with disabilities experience double discrimination, which places them at higher risk of gender-based violence, sexual abuse, neglect, maltreatment and exploitation. (UN Enable)

In India, women make up 49% of the adult population. However they continue to struggle for basic rights, despite many legal and political changes. Girls and women who have disabilities face even more

acute discrimination; which further necessitates the training and education of Gender Equity at school during secondary and senior-secondary levels.

Activities and Lesson Plans for exploring gender identity, gender roles, stereotypes, and healthy views of gender and self; must be implemented at school to promote gender equality.

Activity 1

THE OTHER GENDER IS...
OPINIONS AND FEELINGS CONCERNING THE "OPPOSITE" SEX

Description

This is a student writing-based activity that explores preconceptions, attitudes, and anxieties concerning the "opposite" gender. Discussion is stimulated by student reading of personal narratives.

Objectives

Short Term

- Toanalyze personal and cultural attitudes toward other gender.
- To clearly and cogently expressive as and emotions in writing.
- To present written work verbally to an audience.
- To improve listening skills.

Long Term

To develop healthy, equitable, and realistic attitudes toward the other gender.

MATERIALS: Use student's writing exercise as material for this activity.

PROCEDURE: It is best if writtens work is assigned as homework. If written in classroom setting, peer influence may inhibit honest and thorough effort; also, responses may be more self-conscious.

1. **Ask students to discuss in writing their feelings and opinions about the "opposite" gender.** Give a required length to ensure some thought

and uniformity for reading time when used as a classroom activity. Example: 100 words. Students may want to consider the following questions in their essays:

- In what ways are you different from other students in your class?

- How are you the same as other students in your class?

- Is friendship with the other gender different from same gender friendship? How and why?

- Do you change your actions and activities when you're in the presence of the other gender? How and why?

2. **Separate students according to gender for presentation of essays. Each student reads his/her paper to the class.**

3. **Have listeners respond in two ways:**

   A. Write a short response to the reader.

   B. Offer verbal responses. Ask students to find points they agree with. Explain that responses and view points need to be kept positive.

4. **Bring class back together. Have students volunteer to read their essays. Allow free discussion.** Ask students to consider the following: Was the discussion different with the whole class present? Why or why not?

5. **At the end of the discussion, ask students for positive statements about the other gender and record them on the board under male or female headings.** Point out commonalities. Ask students to list the statements that could be switched to other gender column.

Evaluation

Student writing may be assessed in terms of effort, creativity, content, and style. Speaking and listening skills may be noted during oral presentations and subsequent discussions.

<p style="text-align:center">* * *</p>

Activity 2

Are You Acting Like A Man or A Woman

DESCRIPTION: This activity is designed to help students understand gender roles and expectations that are learned in our society. This is a useful introductory activity on gender roles as related to career and class choices.

Objectives

Short Term

To understand and analyze gender role stereotyping and origins.

- To examine the effects of gender role stereotyping on career choices for both males and females.
- To provide encouragement to those students who are contemplating or have chosen "non-traditional" courses or careers.

Long Term

- To challenge and minimize and/oreliminatestereo typical perceptions and actions towards the "other" gender.
- To accept and support those career and life choices made by peers, even if they may challenge gender role stereo types.

MATERIALS: 1. Newsprint or large sheets of paper divided into three sections.

2. Markers.

Procedure

1. Divide students into small groups no larger than 6 students. Groups can be gender same or mixed groups.

2. Give each group the piece of newsprint divided into three columns. On the top of the middle column either write "Act Like A Man" or "Act Like A Woman". Ask students to make a list of what it means to act like a man or woman in this column. Each group will have a different heading.

3. On the left column, ask students to write down what people might "say" or "do" if someone does not act like a man or woman as defined in the middle column. This portion of the activity can generate a lively and graphic use of words and discussion. Remind students to

be respectful. Some instructors may want to set ground rules around language usage.

4. Divide the right column in half and ask students to list the jobs one would choose if they acted like the descriptions listed in the middle column. For example, the "traditional" female role and career choice might not include welder, construction worker..., a "traditional" male role and career choice might not include elementary teacher, nurse...

5. Hang up the lists for students to view and contemplate, Ask each group to make a few comments about their lists.

6. Assist students with analyzing these lists. Possible questions for discussion include:

- How and where do we learn our perception of male and female roles?
- Do these roles and descriptions limit or enhance us in life choices?
- Have you or someone you know ever acted differently from how your gender is "supposed" to act?
- Have you or someone you know ever stood up for a person who challenged the gender stereotypes?
- What other conclusions/statements do you have about this topic?

Evaluation

Assess the overall work of the group including: contribution, discussion, and analysis. Use a rubric to evaluate the subjective aspects of this activity.

Activity 3

GENDER VS. SEX

Objectives

- To sensitize regarding gender issues.
- To sensitize regarding sex education.
- To identify issues related to gender and sex education.
- To reduce/remove gender based bias and issues

Is gender and sex same????What is Gender ????????What is Sex???????
Each student is given two different colored plain papers of size 3×6 inch
Each student asked to write the following.

Three points on your perception on SEXGENDER	Three points on your perception on
• Physical attributes • Body contours • Chromosomes • Hormones • Body reproductive organs at time of birth entitlements of women and men in a particular society	• Gender refers to social identity of male and female human being • It defines the boundaries of what women and men can and should do. • It shapes and determines the behaviour, roles, responsibilities, expectations.

Tell the students not to mention their names on the paper.

Stick 2 sheets of chart/ brown paper in the classroom

Ask all the students to paste their cards on the chart.

On one chart all the cards having the points on Sex and on the other chart all the cards having Gender points to be pasted.

Discuss: **"SEX AND GENDER ARE NOT THE SAME!!"**

What gender is not....

- Gender is not "Sex"
- Gender is not "Women"

Why Gender Training for All

- It is essential to be sensitive to their needs and issues of both men and women
- It involves transformation of attitudes and practices in all societies.
- to make people aware of the power relations between men and women in society
- to understand the importance of affording women and men equal opportunities and treatment.
- To be sensitive to the needs and perceptions of CWSN

What is Gender Training

- It is one of the important tools to achieve social change.
- Gender Training is a process that widens choices available to people.

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- It is a two way learning process.
- It is based on the belief that experience sharing can bring about
  - change in our mindsets,
  - attitudes, behavior....

Our Gendered Identities

- People are born female or male but learn to be girls and boys who grow into men and women.
- We learn what is appropriate behavior, attitude, role etc. of being a 'man' or a 'woman'
- This learned behavior (Socialisation) makes up our gendered identity and determines our gender roles

Let's have a group discussion on the following topics for 5 -10 min

Toys for girls/boys

Career choices for girls/boys

Role of men/women (at home and in society/community)

Importance of work done by man/woman

Feedback Questionnaire on Gender and Sex

Read the following statements and tick the YES/NO option.

1. The terms sex and gender are interchangeable.
2. The word "Sex" refers to the biological and physiological characteristics that define men and women
3. The word "Gender" refers to the socially constructed roles, behaviours, activities
4. "Gender" refers to attributes that a given society considers appropriate for men and women.
5. "Gender" is a term that refers to social or cultural distinctions associated with being male or female
6. Male" and "Female" words mean sex categories.
7. "Masculine" and "Feminine" words mean gender categories.
8. The aspects of sex vary substantially between different human societies.
9. The aspects of gender vary greatly between different human societies.
10. Having testicles and other male characteristics identify the gender.

11. Menstruation and other female characteristics identify sex characteristics.

Activity 4

GENDER NEUTRAL LANGUAGE

Objectives

- To know the importance of language in the formation of one's beliefs and behavior.
- To realize the importance of gender-neutral language in promoting gender sensitivity.
- To avoid usage of language that makes assumptions about gender makeup of certain professions.

Given below are four pairs of sentences. In which sentence - sentence 'a' or sentence 'b' do you find gender-neutral language is used:

1a. The **chairman** of the company had a miraculous escape last night.

1b. The **Chairperson** of the company had a miraculous escape last night.

2a. **Salesmen** have a tough job at hand.

2b. **Salespersons** have a tough job at hand.

3a. A nurse is trained to understand **her** patients' emotions.

3b. A nurse is trained to understand **the** patients' emotions.

4a. Ask the **fireman** for help to rescue the kitten stuck on the top floor.

4b. Ask the **fire tender** for help to rescue the kitten stuck on the top floor.

Please note how gender specific words can be substituted by gender neutral words as words enlisted below:

Gender Specific Words **Gender Neutral Words**

1. Man/mankind people, human beings, humankind, men & women, Person

2. Man-made synthetic, artificial, manufactured

3. Manned staffed

4. Layman lay-person, the non-expert

5. Workman worker

6. Foreman Supervisor

7. Policeman police officer

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8. Salesman—salesperson, sales staff, sales rep
9. Spokesman—representative, spokesperson, speaker
10. Housewife—homemaker

Reflections

- It is important for us to respect every individual, especially the women in any society.

- Respect for women must be inculcated at a very early stage, especially among the boys.

- Life skills such as Empathy, Self-Awareness and Critical Thinking can help young boys studying in our schools to learn to show and have respect towards women.

- It is good for the boys to introspect from time to time where they stand with regard to respect for those women who are not related to them in any way.

Sex Education at Secondary Level

In recent years, important changes in policies and attitudes have resulted in improved opportunities for children with special needs. However, there has been less change in community attitudes in regard to sexuality and disability. Even today, many people do not acknowledge that most people experience sexual feelings, needs and desires regardless of their abilities. As a result, many young people, including those with disabilities, receive little or no formal sexual health education, either in school or at home.

In the natural course of life, we develop and mature — our brains, our bodies, our sense of who we are and who we want to be. A major aspect of development is development of sexuality and its meaning in adolescent and adult life, and the responsibilities that go along with exploring and experiencing one's own sexuality.

Sex education at school is critically important for students with special needs/ disabilities, which may either be taught under IEP or within the mainstream classroom. However an effort is essential for developing the curriculum and tools to address the many facets of human relationships, developing social skills/ friendships, assuming responsibility of one's own body, including sexuality.

Important areas that may be covered under sex education may include following, which may further be divided into topics/sub-topics. However, we must always grade them keeping in mind the child's abilities and limitations or current level of knowledge on the same.

- Body part names and functions, understanding personal space & respecting boundaries
- Protective behaviours/Body Safety – Feelings, emotional resilience
- Private/Public – body parts, behaviours, places, Masturbation
- Healthy relationships – consent, sex, relationship-specific behaviours
- Sex and Reproduction – conception, pregnancy and birth, same sex attractions
- Safer sex – contraception
- Condoms and STD's

In the following pages, we provide some sample activities, that may help you in planning your lessons in classrooms on the themes of sex education. Some suggested activities at secondary level may include:

- Alike or Different (Body parts),
- Changes in your body/Growing up/Puberty,
- Becoming an Adult (Self-care, self-esteem etc),
- Appropriate Social Skills (Listening, Conversation, Giving compliments,
- Apologizing, Feelings etc),
- Sexual or Physical Abuse etc.

Activity 1

Introduction to Sexuality

Purpose: To introduce the concept of sexuality and provide an opportunity to identify messages about sexuality

For: secondary Class students

Materials: Blackboard, chalk, newsprint, and markers

Time: 15 to 20 minutes

Planning Notes: Expect some nervous laughter when you introduce the topic of sexuality. Some young people may not be used to discussing sexuality in a structured setting. Review the Leader's Resource, *Recommended Ground Rules.*

Procedure

1. Explain that the group will explore definitions of and messages about sexuality. Acknowledge that it is normal for some teens to feel a little embarrassed or uncomfortable. Point out that in our society, although we hear about sexuality all the time in music, television programs, and movies, people often do not have serious discussions about the subject.

2. Write the word "Sexuality" on the board or newsprint. Ask for definitions and write the responses on the board or newsprint. Avoid clarifying what sexuality is or is not.

3. Tell the teens they will work in groups to spend a few minutes thinking about what they have heard about sexuality.

4. Give the following instructions:

   You will be divided into three groups. Each group will have a different assignment. Group One will list what their parents have said about sexuality. Group Two will list what their friends have said about sexuality. Group Three will list what they have seen or heard about sexuality through the entertainment media—movies, music, magazines, and television.

5. Clarify that it is okay to list whatever they have heard or seen. There are no right or wrong answers in this activity.

6. Have the teens count off by three. Form groups in three different areas of the room.

7. Give each group a marker and newsprint. Assign "parents," "friends," or "media" to each group. Tell teens they have five minutes to brainstorm, as discussed above.

8. Circulate and give suggestions to help groups start. (For example, friends might say, "Everyone is having sex." Parents may have said, "Sex should wait for marriage." A common media message is "You'll be attractive to guys/girls if you use our product."

9. After five minutes, ask each group to post the newsprint and share its list of messages.

10. Conclude the activity using the Discussion Points below.

Discussion Points

1. How are the messages from parents, friends and the media similar? Different? Why do you think that is so?
2. Which messages do you agree with? Disagree with?
3. Can you think of any sexuality messages you have heard from other sources, such as religious teaching, romantic partners or health teachers?
4. If you were a parent, what is the most important sexuality message you would give your child?
5. Which of these messages might make a person feel uncomfortable talking about sexuality?
6. Are there messages you think are incorrect and that you want more information about?

Adapted from *Life Planning Education,* a comprehensive sex education curriculum.

Washington, DC: Advocates for Youth.

Activity - 2

Safety Net

Objectives

- To understand the importance of feeling safe and supported.
- To be aware of the support system available to students at the time of need.
- To understand that gender biases in the society are responsible to a large extent for more number of girls rather than boys falling prey to such situations.

Activity

Discuss with your partner and write some points on following:

Meaning and Importance of **"Being Safe"**.

Safety rules to be followed at home, school and around them.

Meaning of the term **"Safety Net"**.

Suggest members of this safety net. Are they different for boys and girls?

Prepare a list of "Safe people" to whom they can go to in times of need/ crisis at the following places:

Home

School

Neighbourhood

City/village/town

Life Skills & Vocational Training

Children with special needs require considerably more assistance during their primary and secondary education so that they can be ready to function independently after they graduate from school. There are several key conceptual areas that teachers will need to address in an inclusive education setup for children with disabilities before they will be able to thrive on their own in the community.

Life skills are essential to job functioning, and they must be included in instruction for students with special needs. Without separating training and instruction they often fail to hold their jobs. A life skills curriculum approach blends academic, daily living, personal/social, and occupational skills into integrated lessons designed to help students learn to function independently in society. The major training component must include:

Occupational Skills: Majority of students with disabilities find themselves either without a job or with a job far below their ability levels. Concepts like the benefits of hard work, the virtues of doing work, the different types of jobs, the requirements that those jobs have for their applicants and the importance of following rules are important to teach. Skills such as knowing how to find a job, interview for a job, find and take advantage of available vocational training, collaborate in the working environment and to follow an employer's requests should all go into a life skills curriculum.

Social Skills: This skill set can be even more difficult to teach than the occupational skills, because much that goes into the socialization process is based in the emotions, and many special-needs children have received

so much negative feedback from the public at large that it is difficult for them to get around that perceived stigma and pursue autonomy. Principles including self-awareness and self-confidence are vital parts of a life skills curriculum. Developing the ability to see how others perceive you is one of the biggest steps that any student can take, and taking that ability and converting it into behavior that suits social norms, such as respecting others, acting appropriately in a variety of social situations, forming and keeping friendships and taking ownership of mistakes will benefit students with disabilities of all ages as they enter the work force.

Daily Living Skills: Falling into a familiar, day-to-day routine can bring comfort to special needs students as they move out into the real world, but the challenges that go along with creating this routine can be challenging for them. Basic training items as maintaining personal hygiene, seeking medical attention when needed, exercising to stay healthy, buying the right sort of foods to eat a nutritionally balanced diet and making sure that they have the clothes that they need are all crucial parts of this skill set. This may also be extended to include training on safety and how to react in different types of emergencies.

Community Skills: This skill set is somewhat different than interacting with others, and also from coping with emergencies. These skills help the student become a contributing member of a community at large. Skills such as joining the local recreation center or summer pool would be part of this, as would playing in a summer basketball league or putting together a friend's birthday party. Following legal requirements such as renewing a driver's license on time, voting, notifying the police in case of a crime etc. are a part of this skill set.

Life skills programs assist persons with a disability to learn the basic skills of daily living. Services may include training in the ability to travel about the community alone; to live independently in a private residence; to maintain health through self-care and use of medical services; to live within their personal income; to maintain grooming and appearance; and to cope with other requirements of successful independent living.

The main aim of life skills training is to provide young adults with special needs, the skills they need for a successful work, community, and home life. The training must provide instruction in a wide variety of settings and teach key skills related to independence, social relatedness, and emotion regulation.

For children with neuro-developmental disabilities, this training is ideally a transition program, spanned over 2-3year design to teach both specific skills (e.g. functional academics, job skills, social skills) and more general success skills (less prompt dependence, social fluency, and self-regulation) that predict overall success. In the following pages we've listed out few skills that may be considered as per the need, ability and age appropriateness for the child. However, it is not a comprehensive list, and teachers may exercise their wisdom and include activities/skills as deemed essential. This is just a draft for building upon the skill pool that is considered essential towards independent living.

What are Life Skills?

Life skills include a wide range of knowledge and skill interactions believed to be essential for adult independent living (Brolin, 1989). Students with special needs must be able to dress and groom properly, use appropriate table manners, make decisions about money, and use transportation to get to work. The three major skill areas that need to be addressed are daily living, personal/social, and occupational skills.

What are Daily Living Skills?

Many students with disabilities will marry and raise families. The majority will probably earn modest salaries; therefore, it is crucial that they learn how to manage a home, family, and finances as effectively as possible. The following skills are some that may be considered essential for independent adult living:

Managing Personal Finances

Count money and make correct change.

Manage a savings and checking account.

Maintain a personal budget and keep records.

Demonstrate personal finance decision-making skills.

Make responsible expenditures.

Calculate and pay taxes.

Use credit responsibly.

Pay bills.

Deal with renting or leasing.

Selecting and Managing a Household

Perform or arrange for home maintenance.

Perform housekeeping tasks.

Plan and prepare meals.

Fill out warranty cards for new appliances and mail them.

Caring for Personal Needs

Exhibit proper grooming and hygiene.

Dress appropriately.

Obtain health care.

Avoid substance abuse.

Demonstrate knowledge of common illnesses, prevention and treatment.
Maintain physical fitness, nutrition and weight.

Safety Awareness

Identify safety signs.

Identify unfamiliar odors.

Identify unfamiliar sounds.

Demonstrate knowledge and ability to evacuate a building in an emergency. Read and understand basic safety procedures. Obey safety rules when walking during the day or at night.

Raising, Preparing & Consuming Food

Purchase food and plan meals.

Clean food preparation areas.

Store food properly.

Prepare meals, read labels, and follow recipes.

Demonstrate appropriate eating habits.

Plan and eat balanced meals.

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Buying and Caring for Clothing

Wash clothing.

Purchase clothing: Demonstrate knowledge of prices and sales.

Iron, mend, and store clothing.

Demonstrate use of dry cleaners and laundromat.

Exhibiting Responsible Citizenship

Demonstrate knowledge of civil rights and responsibilities.

Get legal aid.

Report a crime.

Register with Selective Service at age 18.

Demonstrate knowledge of local, state, and federal governments.

Demonstrate knowledge of the law and ability to follow the law.

Demonstrate knowledge of citizen rights and responsibilities.

Vote.

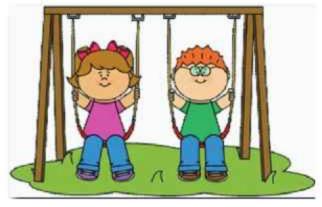## Using Recreational Facilities & Engaging in Leisure Activities

Demonstrate knowledge of available community resources.

Choose and plan activities.

Demonstrate knowledge of the value of recreation.

Engage in group and individual activities.

Plan vacation time.

Plan a social event.

Engage in hobbies, sports, music, arts and crafts.

Getting around the Community

Differentiate between right side and left side, front and back, to demonstrate location. Demonstrate knowledge of traffic rules and safety. Demonstrate knowledge and use of many means of transportation including carpools. Understand and use a map. Drive a car; obtain a learner's permit, then a driver's license. Obtain car insurance.

What are Personal/Social Skills?

Personal and social skills are critical in keeping a job and maintaining friendships. Learning to get along with others is a challenge for everyone. Lack of appropriate personal and social skills is one of the most frequently cited causes of termination of employment. Students with special needs often do not learn by observing. Skill instruction in this area should include the following:

Achieving Self-awareness

Identify physical and psychological needs.

Identify interests and abilities.

Identify emotions.

Demonstrate knowledge of physical self.

Demonstrate proper care, use, and maintenance of prosthetic devices or sensory aids required.

Use appropriate methods to cope with stress.

Acquiring Self-Confidence

Express feelings of self-worth.

Describe others' perception of self.

Accept and give praise.

Accept and give criticism.

Develop confidence in self.

Identify and distinguish the proper way to answer and use the telephone. Wear appropriate apparel, using clothes or uniforms to fit social and work situations.

Achieving Socially Responsible Behavior

Develop respect for the rights and properties of others.

Recognize authority and follow instructions.

Demonstrate appropriate behavior and social etiquette in public places and when dating or

eating out. Demonstrate knowledge of important character traits. Recognize personal roles.

Maintaining Good Interpersonal Skills

Demonstrate listening and responding skills. Establish and keep close relationships. Make and keep friendships.

Achieving Independence

Do things without help.

Accept responsibility for actions.

Get around community and be able to travel.

Cope with changes in travel schedule.

Cope with being lost.

Follow travel safety procedures.

Choose friends.

Get to school on time.

Decide what to wear.

Achieving Problem-Solving Skills

Seek assistance when needed.

Recognize problems.

Anticipate consequences.

Develop and evaluate alternatives.

Develop goals, solutions, and plans.

Communicating with Other

Recognize and respond to emergency situations.

Communicate with understanding.

Demonstrate knowledge of social cues and the subtleties of conversation, both verbal and nonverbal. Listen to others.

What are Occupational Skills?

A huge percentage of individuals with disabilities remain unemployed and underemployed. Educators and parents still have much to do in this

area. Early educational efforts need to be directed toward the following skill areas:

Knowing and Exploring Occupational Options

Explore occupational possibilities.

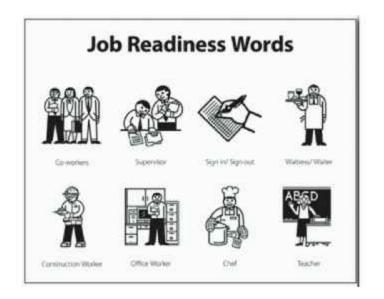Identify the rewards of work.

Locate sources of occupational and instructional information.

Identify personal values met through work.

Identify societal values met through work.

Classify jobs into categories.

Investigate local occupational and instructional opportunities in the community; make site visitations.

Job Readiness Words

Co-workers   Supervisor   Sign in/ Sign out   Waitress/ Waiter

Construction Worker   Office Worker   Chef   Teacher

Selecting and Planning Occupational Choices

Make realistic occupational choices.

Identify requirements of appropriate and available jobs.

Identify occupational aptitudes.

Identify main occupational interests.

Identify major occupational needs.

Exhibiting Appropriate Work Habits and Behavior

Follow directions and observe regulations.

Recognize the importance of attendance and punctuality.

Recognize the importance of supervision.

Demonstrate knowledge of safety.

Work with others.

Meet demands for high-quality work.

Work at a satisfactory rate.

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Seeking, Securing, and Maintaining Employment

Search for a job.

Apply for a job.

Interview for a job.

Maintain post-school occupational adjustment.

Demonstrate knowledge of competitive standards.

Know how to adjust to changes in employment.

Exhibiting Sufficient Physical and Manual Skills

Demonstrate stamina and endurance.

Demonstrate satisfactory balance and coordination.

Demonstrate manual dexterity.

Demonstrate sensory discrimination.

Obtaining Specific Occupational Skills

Attend prevocational learning stations or centers. Take advantage of in-school work experiences. Take advantage of volunteer experiences. Serve in community rotations. Take advantage of work/study services. Attend vocational classrooms. Obtain special vocational education. Obtain on-the-job training.

What can The Schools or Teachers Do?

Teachers and Schools together can prepare an entry and exit plan for every student with special needs wherein the life skills are listed, worked on and are achieved prior to child moving out of school. Teachers must become advocates for each child with special needs and stress "hands-on" life skill mastery.

In the following pages, a sample lesson plan is drafted to help demonstrate and understand the way it may be incorporated in a mainstream classroom. Please feel free to use this draft in your classroom and improvising it as per your need.

Life Skills

Life Skills are Like The Ingredients In A Recipe....

- Remember the Individual Ingredients
- Use the right amount
- In the right combination
- And at the right time
- To prepare an enjoyable dish called "Life"

Introduction

This session will introduce and sensitize student to utilize Life Skills.

Methodology

1. Note for the teacher

   Please read the Annexure before taking the session

2. Welcome the students and share with them that we will take up an interesting topic today and come to know about some important aspects related to our daily lives. Ask the students:

   "Can we learn something from animals, birds and insects around us". Elicit responses of the students like hard work from ants, faithfulness from dogs etc. the facilitator can supplement from various stories and explain that we can learn many valuable lessons from many short animal stories.

3. Ask them "How many of you remember the story of The Thirsty Crow"

4. Ask one or two students to narrate the story in brief.

5. Appreciate and applaud the students, who have recounted the story.

6. Tell the students we will try to learn something more from this story.

7. Ask one student to read out the first paragraph of the story

8. After the student has read the first paragraph ask the class the following questions to start a discussion.

What were the thoughts and feelings of the crow?

9. Encourage the students to understand that the skill of knowing about self is called *"self-Awareness*.

10. Ask the students that what kind of thinking was involved and take them to the life skills of critical and creative thinking.

11. Ask the students what would have they done if they were in the crow's place?

12. Then ask a student to read the second paragraph of the story

13. Ask the following questions and bring about a discussion:

  • What problems did the crow face in drinking the water from the pot?

  • What did the crow do to quench his thirst? (Note for the teacher - to solve the problem-problem solving and decision making)

The Thirsty Crow!

1. A crow, who, while flying around, felt very thirsty as it was peak summertime. From afar he spotted an earthen pot (Matka) and thought to himself.

   "Hmmm, there must be some water in it"! And flew down eagerly towards the pot. He sat on the edge of the pot and looked inside. He was not happy to see as the cool, clear water inside the post was too low for the crow's beak to reach. The crow was disappointed but very thirsty and badly wanted to drink water to quench his thirst.

2. The crow didn't lose heart or got upsetbut kept sitting there. he thought to himself.

   "What can I do to reach water? The pot is heavy, so I cannot overturn it. It is thick so it will not break with my beak. What else can I do so that I can have a drink of water? What new thing can be done by me?"

   These stones in the pot so that the level of water rises? Then I can have as much water!"

   He put himself to the job and started putting stones in the pot. In no time the water level of the pot rose and the crow drank the cool clear water to his heart's content. Now no more thirsty — he flew away.

Key Messages

1. Life skills are required for day to day living and for managing all situations

2. Life skills can be learnt from many sources

3. Life skills are used in combination for self-identity, studies, work, future jobs, exams, habits, behavior, managing and overcoming stress, lifestyle and many other things (including from stories, parents, teachers and our own experiences)

Generic Life Skills Are

- Inter related
- Inter dependent
- Reinforce each other
- Do not "Stand alone"
- Can be acquired and practiced
- Can be transmitted

Annexure

What are life skills?

WHO Definition -

"Abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life."

Life skills enable people to translate knowledge (What one knows) and **attitudes/values** (What one believes and feels)

into action (What to do and how to do it).

Life skills can be defined as one's abilities for **positive behavior** that help us in making informed choices in life.

Significance of learning Life Skills

- To be able to explore alternatives
- Weigh pros and cons
- Make rational decisions
- Communicate effectively
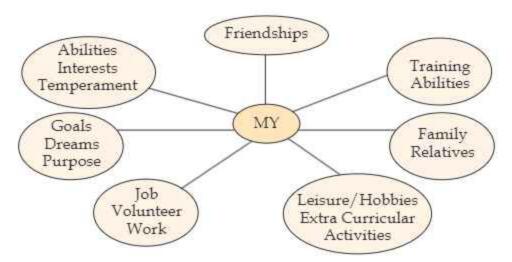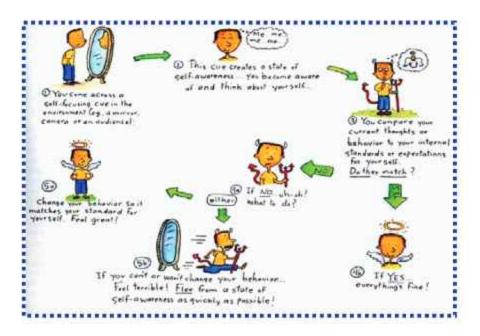- To say "No"
- Be assertive

CORE LIFE SKILLS CAN BE DIVIDED IN THREE GROUPS

Thinking Skills	Emotional Skills	Social Skills
• Self Awareness • Critical Thinking • Creative Thinking • Decision making • Problem solving	• Coping with Emotions • Coping with Stress Relations	• Empathy • Interpersonal Relations • Effective Communication

SELF AWARENESS

Who and what are you really?

Self Awareness is the Ability to Understand Our

- Strengths, weaknesses, values, outlook character, our needs, desires aspirations, outselves, feelings.
- I like myself even though I am imperfect.
- Self awareness is a unique human capacity.

Empathy

- Ability to understand and accept others
- To put oneself in other person's shoes
- Being nurturing and tolerant
- Encourages a positive behavior towards people in need or difficulty

Creative Thinking

- New ideas about things that are taken for granted.
- "Think out of the box".
- Enables to explore available alternatives and consequences of actions or non-actions
- Contributes to Decision Making & Problem Solving
- Helps adolescents to respond adaptively and with flexibility to the daily life situations

Critical Thinking

- Analyze and judge the information provided.
- Helps adolescents to recognize and to assess the factors influencing attitude & behavior - values, pressures (peer, family)
- Weigh the pros & cons and the consequences of any action.
- Key to form right attitudes towards life Assists in developing responsible behavior.

Decision Making

- Abilities to assess available options
- To foresee the consequences of different decisions (actions/non-actions)

No decision is also a decision

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Problem Solving

- helps us to deal constructively with problems in our lives.
- Significant problems that are left unresolved can cause mental stress and give rise to accompanying physical strain

Coping with Emotions & Stress

Coping with Stress

Your state of mind Affects

Your body,

Your attitude & outlook,

And your behaviour

Coping with emotions

- Recognizing effects of emotions on others and ourselves
- Being aware of how emotions influence behaviors
- Able to respond to emotions appropriately

Effective Communication

- It is important to express ourselves effectively so that what we want to communicate reaches the intended recipient
- verbally & non-verbally
- To express opinions, desires, needs & fears also
- To ask for advice and help

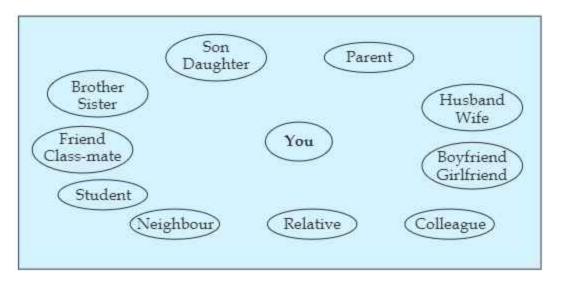## Non Verbal Communication also matters

Non-verbal Communication

- Body-language
- Facial expression
- Head & hand movement
- Position
- Behaviour
- Appearance
- Tone of voice
- Pitch of voice
- Immediate answers
- Long pauses
- Silencel

Interpersonal Relationships

- help us to relate in positive ways with the people we interact with.
- make and keep friendly relationships required for social support.
- It may also mean being able to end relationships constructively.

Your behaviour depends on your Role & The Situation

Effective Acquisition of Life Skills can Influence

- The way we feel about ourselves
- The way others perceive us
- Our productivity
- Self confidence
- Self esteem
- Interpersonal relationships

Improvement In Life Skills Can Result In

- Individuals making informed choices to serve the interest of self and others
- Becoming proactive and change agents
- Resolving conflicts and coping with stress
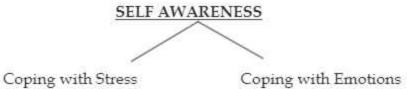- Developing negotiating skills for personal and social interests

LIFE SKILLS WORK BEST IN COMBINATION GETTING TO KNOW YOURSELVES
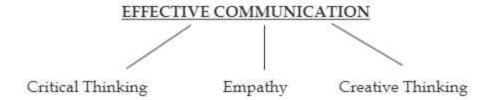
SELF-AWARENESS +CRITICAL THINKING
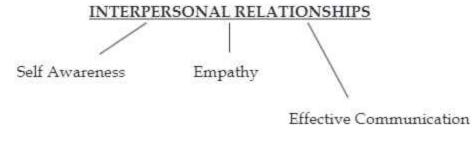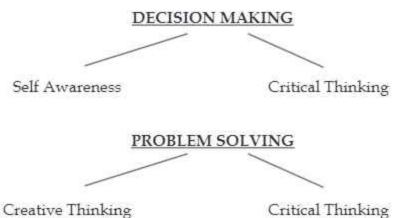
WORKING TOWARDS YOUR GOAL

SELF-AWARENESS + CRITICAL THINKING + CREATIVE THINKING

SELF AWARENESS

Coping with Stress   Coping with Emotions

EFFECTIVE COMMUNICATION

Critical Thinking   Empathy   Creative Thinking

INTERPERSONAL RELATIONSHIPS

Self Awareness   Empathy

Effective Communication

DECISION MAKING

Self Awareness   Critical Thinking

PROBLEM SOLVING

Creative Thinking   Critical Thinking

Complementary Therapeutic Services

Intervention for individuals with disabilities come in a variety of different forms. The best practices or regimens are the result of an individualized intervention plan formed by a team of multidisciplinary professionals. This plan is based on the severity of the disability and should involve the individual, families, teachers, and caregivers in all phases of planning, decision making, and intervention. The individualized plan takes into consideration both the immediate needs and the long-term prognosis for development.

Many parents who have a child with a disability have found great benefits in pursuing various complementary therapies and have experienced significant impact of these therapies in their child's life. Most of these "unconventional" therapies have been around longer than those used in Western medicine, but they are often not accepted by the medical community due to lack of research and overall awareness.

These complementary therapies can help manage or increase adaptive skills and behaviors, improve general health and wellbeing; alongside improving the quality of life for a child with a disability or special need. Many alternative therapies complement more traditional therapies that a child may be receiving, such as physical, occupational and speech therapy.

Complementary and Integrative implies that these therapies are performed in addition to, and not in place of, conventional therapies; and are primarily used in conjunction with or to complement conventional interventions. Although we do recognize the constraints of incorporating them in the

mainstream education system, however; their significance and need for holistic development and wellbeing of children with special needs cannot be undermined, thus making it highly essential for all to get an overview of the available and prevalent complementary therapies:

- Speech & Language Therapy
- Physical Therapy
- Dance / Movement Therapy
- Sports Therapy
- Play Therapy
- Theatre / Drama Therapy

- Occupational Therapy
- Psychological / Behavior Therapy
- Music Therapy
- Art Therapy
- Animal Assisted Therapy
- Yoga Therapy etc.

Speech and Language Therapy

- Many conditions, including cerebral palsy, autism, hearing loss, developmental delays, may cause difficulty with speech and language development. Some children may not understand language. Some children may understand language but be unable to communicate effectively due to difficulty with speech. Sometimes children experience challenges in other areas of communication, such as hand gestures and facial expressions.

- Speech therapy is a clinical intervention aimed at improving speech and language skills and oral motor abilities. Children who are able to talk may work on making their speech clearer, or on building their language skills by learning new words, learning to speak in sentences, or improving their listening skills. Children who cannot talk may learn sign language, or how to use special equipment such as a computer that speaks for them. Children who talk but have challenges with more discreet communication issues such as facial expression or gestural language use, may work on these areas of communication.

Physical Therapy/ Physiotherapy

- Physical therapy (PT), or sometimes called physiotherapy, focuses on improving gross and fine motor skills, balance and coordination, and strength and endurance. Gross motor skills include activities that use the larger muscles of the body, like rolling, crawling, walking, running

or jumping. Fine motor skills use the smaller muscles, such as the ability to hold a spoon or pick up a toy.

• Physical therapy services are an important part of early intervention and school programs at different stages in a child's life. Some children may also require short periods of physical therapy services at a clinic or hospital to improve movement and mobility skills for participation in their communities.

• PT helps assess muscle and joint function, mobility, strength, muscle tone, endurance, oral motor skills such as feeding and talking, posture and balance, even the status of the heart and lungs. They also monitor the function, fit, and proper use of mobility aids, positioning devices, and braces

Occupational Therapy

• Occupational therapy (OT) helps people achieve independence in all facets of their lives. Most people think of it as a treatment for adults that helps them get back to work, but that is a very narrow definition. "Occupation" refers to managing all the activities important for independent living. For children, their main job is playing, learning and doing age appropriate activities of daily living (e.g. dressing, eating, bathing).

• PT and OT can be confused with each other. Physical therapy deals with the issues of pain, strength, joint range of motion, endurance, and gross motor functioning, whereas occupational therapy deals more with fine motor skills, visual-perceptual skills, cognitive skills, and sensory-processing deficits. Both types of therapy help children improve the quality of their lives.

Sensory Integration Therapy

• Sensory integration therapy aims to help kids with sensory processing issues (which some people may refer to as "sensory integration disorder") by exposing them to sensory stimulation in a structured, repetitive way.

- It aims to enable individuals to internalize and regulate their sensory responses to the environment around them.

- It uses activities to create or reinforce the connections between the body's sensory system and the brain. Some children do not correctly develop sensory processing (or integration) through normal development, and require this therapy to enable them to reach these important developmental stages.

Dance / Movement Therapy

- A body-based therapy that is successfully delivered as an integral part of a multidisciplinary programs, to both groups and individuals.

- The body and the mind are linked; interventions that focus on the body impact the mind also. Dance / Movement Therapy brings beneficiaries back to the body, their most basic form of support, increases body awareness, and builds a sense of self at the body level.

- Dance and Movement therapy is an action-based therapy that uses Music to support mood creation and also uses Props for Sensory Integration; thereby said to enhance or address: Physiological Needs, Psychological Needs, Creativity, Communication, Planning skills, Body Awareness, Breathing etc.

Music Therapy

- Music therapy is the prescribed use of music applied by a trained professional for achievement of goals in following areas:
    - Psychological,
    - Physical, Physiological,
    - Psycho-social
    - Cognitive
    - Emotional

- All human beings are able to experience music; a "universal language"; considered as a socially appropriate leisure skill; and provides a flexible and structured mode of intervention that is non-threatening, inviting and highly motivational for participation by children.

- It allows for participation at one's own level and inspires physical, emotional and spiritual responses in the participant.

- It is considered highly adaptable and can be designed to reinforce Non-Musical activities or skills (*Cognitive, Academic, Motor, Emotional, Social, Leisure etc.*)

Drama / Theatre Therapy

Drama therapy is utilized to help a client:

- Solve a problem
- Achieve a catharsis
- Delve into truths about self
- Understand meaning of personally resonant images
- Explore/transcend unhealthy patterns of interaction
- Theatrical interventions include:
  - Role Play–Theatre Game
  - Group Dynamic Games–Mime
  - Puppetry–Other Improvisational Techniques

Art Therapy

- It is a form of expressive therapy that uses the creative process of making art to improve a person's physical, mental, and emotional wellbeing.

- Combines traditional psychotherapeutic theories and techniques with an understanding of the psychological aspects of the creative process, especially the affective properties of the different art materials.

- Art therapy can achieve different things for different people. It can be used for counseling by therapists, healing, treatment, rehabilitation, psychotherapy, and in the broad sense of the term, it can be used to massage one's inner-self in a way that may provide the individual with a deeper understanding of him or herself.

Play Therapy

- It is a form of counseling or psychotherapy that uses play to communicate with and help people, especially children, to prevent or resolve psychosocial challenges. This is thought to help them towards better social integration, growth and development, emotional modulation, and trauma resolution.
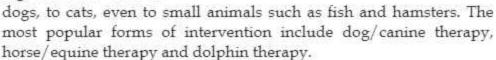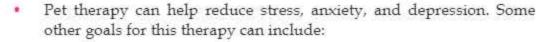
- Play therapy can be used for:
    - Awareness and management of emotions
    - Self-empowerment
    - Improving self-control
    - Strengthening self-worth
    - Assertiveness and taking risks
    - Healthy venting of aggression
    - Treatment following sexual and other abuse
    - Relaxation techniques

Animal Assisted Therapy

- A therapy that involves animals as a form of intervention. Its goal is to improve a patient's social, emotional, or cognitive functioning.

- It is a guided interaction between a person and a trained animal. It also involves the animal's handler.

- Animals used in therapy include domesticated pets, farm animals and marine mammals.

- There are many types of interventions ranging from the use of dogs, to cats, even to small animals such as fish and hamsters. The most popular forms of intervention include dog/canine therapy, horse/equine therapy and dolphin therapy.

- Pet therapy can help reduce stress, anxiety, and depression. Some other goals for this therapy can include:
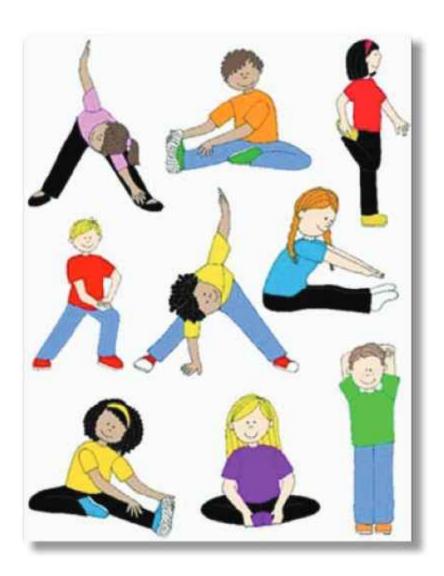
  - improving motor skills and joint movement

  - improving assisted or independent movement

  - increasing self-esteem

  - increasing verbal communication

  - developing social skills

  - increasing willingness to join in activities

  - improving interactions with others

  - motivating willingness to exercise etc.

Yoga Therapy

- It is a type of therapy that uses yoga postures, breathing exercises, meditation, and guided imagery to improve mental and physical health.

- The holistic focus of yoga therapy encourages the integration of mind, body, and spirit.

- Modern yoga therapy covers a broad range of therapeutic modalities, incorporating elements from both physical therapy and psychotherapy.

- Unlike a standard yoga class, yoga therapy sessions are typically conducted in one-on-one or small group settings.

Chapter 8

Teaching Materials, on Line Learning and Assistive Technologies for Different Disabilities

| Types of disability of SpLD Dyslexia	Lectures		Assistive technologies for lectures
	Teaching materials	on line learning	
	• flow charts are ideal for explaining procedures • pictograms & graphics help to locate information • avoid abbreviations if possible or provide a glossary of abbreviations and jargon • use short, simple sentences in a direct style and give instructions clearly • avoid text in block capitals because this is much harder to read and white backgrounds	• on line navigation through teaching materials should be easy & site map is helpful • use graphics, image,s and pictures to break up text • offer alternate download pages in a text reader friendly style • avoid using white backgrounds for web resources • Web Reader	• assistive technologies for dyslexic people including reading devices and software since reading is the area in which students with dyslexia struggle the most Learning Ally, Read2Go, iBooks, Kindle, Audiobooks from Audible, ZoomReader, ClaroSpeak US including an option for OpenDyslexic font. Speak it! Balabolka, Natural Reader.
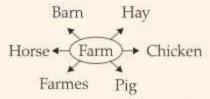
	• provide handouts giving an overview of main points, well in advance of lectures. This enables a student to prepare effectively, and provides an outline which can be annotated during the lecture
	• vary styles of delivery. Present information visually where ever possible and consider using alternative media videos, tapes, CD ROMs
	• dyslexic students often need points repeating, to ensure that information passes into their long term memory. Give summaries at beginning and end of lectures and revisit points of learning at intervals.
		• The users of e-learning materials should be able to change.
		  • front, font style & size, font colour
		  • cursor size, style and blink rate;
		  • size of text and images;
		  • screen layout, colours and backgrounds
		• learning objects must have control options for timing of events, multimedia elements, including video, and navigation – allowing the user to skip a section or return to a section.
			• lpad apps: OpenWeb - freeWeb browser using the OpenDyslexic font, Fleksky - free Assisted touch typing on the IPad screen.
			• Students may use recording devices in lectures, and personal digital assistants to assist with personal organization.
			• Speech to text options for students who have mobility problems
			• LAMP

Mentally Retarda-tion	• Use hands on demonstration, as they have difficulty with abstract concept. • Break information or tasks down into smaller parts. Too much information at once can confuse them. • Provide deceit and immediate feedback. Individuals $\bar{c}$ MR need it b'co2 it enables them to make a connection between their behaviour and leader response.		• Language Acquisition through moter planning, connects neurological and motor learning in a way that make communication easier for students c autism & related problem.

Teaching Material for MR		
• Reward system - using a sticker chart for each student • Use different coloured chalks for each line to make copying from the board easy for child c̄ dyslexia • Do not give them open ended questions that involve incomplete instructions • Instead of long, written assignments, two these tasks into projects that involve all the souses. There could be done by using real objects, pictures, oral report. He needs to be seeing, listening discussing and using their hands.	• Mind Maps can be used in each subject. Barn Hay Horse ← Farm → Chicken Farmes Pig • Simplify, summarize and compress the information. Use mnemonic devices, they increase learning efficiency. • Take regular study peaks. Use times or stopwatch to remind & send child for 10 minute break.	
Visual Impairment	• materials in large print or Braille • audio materials recorded on tape, DVD, etc. or via computer • Captioning course videos • enlarged or tactile drawings • tactile demonstrations incorporated into instruction for understanding concepts • electronic dictionaries (e.g. languages or science-based dictionaries) with audio • use email for class notes and other teaching materials instead of printed documents for blind students (they can be converted in audio	• on line audio materials • e-books Accessible books, Sugamya Pustakalay • access to an line assistive technology that provides enlarged text, voice recordings • suggest students to use: • Web Reader, Firefox – Fire Vox for web page reading aloud • ATbar – a cross browser toolbar with text enlargement, colour, front and line spacing changes, text to speech, dictionary and spell checker • Web2Access — to learn more about which interactive and social networking sites are accessible	• in-class access to a computer/laptop with screen-reading software or assistive technology for taking notes and communicate during classes: Tran-scriptions - Panopto with Synote http://linkeddata.synote.org/ offereing synchronised annotations • use of visual assistive technologies that provides enlarged text: ZoomReader, voice: ClaroSpeak USA, Speak it! Balabolka, Natural Reader, LiveScribe, or Braille output, FingerReader http://itunes.aple.com/gb/app/prizmo-sanning-ocr-speech/id366791896?mt=8

	information through screen reading software) • e-books.	• Webanywhere listen to web pages being read aloud just b adding your chosen web address to the edit box on the site. • RNIB Accessibility toolbar for Internet Explorer • LowBrowse for Firefox – delivers web pages in a text friendly way with text to speech options and colour, font changes etc.	• Braille translation software and embossing equipment • Software based tools such a screen readers, screen magnifiers such as hand held magnifiers: SenseView, text to speech software &screen inters. Hard-ware based tools such as refreshable braille, CCTV magnifiers or portable magnifiers, talking tools (ex meas-uring jugs, rulers etc.)
		• Black Window freeware – Enhance visibility and reduce destructibility of other programs • for disciplines including math, use: see Touching maths, use ViewPlus graphing, Mathtalk, Mathtype, and MathML support within ePub3 readers: http://docs.mathjax.org/en/latest/misc/epub.html, also Robobraille for spoken Math - Daisy and MP3 • to read on line equations: www.stemreader.org	• suggest students to use NVDA screen reader Virtual Magnifying Glass, SumatraPDF, WebbIE, and free software for print to audio conversion, ex: Create&Convert - JISC RSC Scotland SE TAMC - Techadapt, Save as Daisy and Pipeline - Office 2010 - Daisy Consortium, Ra=obobraille [9] • suggest students to use mobile phone apps, for Android phones ex. eyes free, talkback & Digital Talking Timer, for IPhone the built in accessibility featuers ex. VoiceOver and Zoom or Eye Reader and Voice of Daisy [9]

Hearing Impair- ment	• printed and video materials offered before classes with captioning (involves synchronizing text with audio content of a viceo presentation); • facing student for lip reading; • reinforce spoken information with visual aids (e.g. writing on the board, slides, OHPs) • A student who has been deaf from birth may require the use of a thesaurus, dictionary or sign language interpreter during lecturers and exams. • When possible, provide the student with class outlines, lecture notes, lists of new technical terms and printed transcripts of audio and audio-visual materials. • Do not hesitate to communicate with the student in writing when conveying important information such as assignments, schedul- ing, deadlines etc.	• on line video materials with subtitles • on line multimedia presentations with subtitles • learning objects must have control options for timing of events, multimedia elements, including video, and navigation - allowing the user to skip a section or return to a section.	• use of hearing assistive technologies (ex. FM systems) • use of overhead projector or blackboard • portable computer with speech output for participating in class discussions due to hearing or speech impairment • mini-disc recorder.
Mobility Impair- ment (inc wheelchair users)	• Account for the time and fatigue factors which may arise as the student moves between lectures • Consider supplementa- ry video or multimedia presentations as options to field trips	• advise students to use more on line resources rather than library resources that involve more time and efforts	• wheelchair access to classrooms.

Exam adjustments			
Types of disability or SpLD	Exams		Assistive technologies for exams
	evaluation	on line tests	
Dyslexia	• It is usual practice for 25% extra time to be awarded in closed examinations for those diagnosed with dyslexia, to allow for slower speeds of reading and writing [6] • alternate different evaluation methods: multiple choice, essay, etc.	• on line evaluation tests with extra time provided	• assistive technologies for cyslexic people including readings devices and software
	• Students may be using mind mapping and text to speech software which assist in the identification of errors in written work • Increasingly, requests are being made for alternative forms of non-written assessment to be considered, acknowledging that many dyslexic students have excellent verbal skills. • exemption from IIIrd language • provision for scribes • provision of paper in larged print for 20 mins/hour	• learner with low vision	• H.I. spastic dyslexic of destabilisation as per PWD Act

Visual Impairment	• provide extra time in examinations (aprox. 25%, 50% additional time). Examinations papers may need to be enlarged or Brailled, with tactile diagrams, maps, etc. • some may need a reader, an oral examination with the examiner, audiotapted questions, or large print papers	• access to on line evaluation tests using assitive technology that provides enlarged text, voice recordings • Web Reader	• it may be necessary to provide heavy line paper, a scribe, or special writing implements • some students may undertake examinations using a personal computer with voice synthesizer • it may be necessary to provide extra space for equipment and specific personnel, or a separate examination venue if the noise from equipment being used is likely to be distracting for other students • use email for evaluation instead of printed documents for blind students (they can be converted in audio information through screen reading software)
Hearing Impairment	• provide extra time in examinations (approx. 25%-50% additional time) for students who need to listen the evaluation tests. • use visual aids in evaluation tests (e.g. writing on the board, slides, OHPs)	• access to on line evaluation tests using assistive technology if necessary	

Mobility Impair-ment (inc wheelchair users)	• a reader or an oral examination (either presenting answers on tape or participating in a viva) are alternatives to the conventional written paper • alternate different evaluation methods: multiple choice, essay, on line evaluation etc. • for an oral examination allow extra time for the student to listen to and refine or edit responses • in your assessment, allowance should be made for the fact that spoken answers are likely to be less coherent than written answers • for some students the combination of written and oral examination will be most appropriate • some students with a mobility disability may need rest breaks	• on line evaluation tests with extra time provided	• students may need to use a personal computer/laptop or a personal assistant in an examination. If so it may be necessary to provide extra space for equipment, or a separate exami9nation venue if the noise from equipment (for example a voice synthesizer) is likely to be distracting for other students.
X	• Alternate question papers in subjects of Eng. communicative of social science		
XII	• M.C.Q based on practicals in science in view of practicals		
Ref. — Saleie Project Ref No. 527877-LLP-1-2012-UK-ERASMUS-ENW			

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Chapter 9

Case Studies

1. Veena Mehta Verma

Veena receiving NAB Award of excellence starting formal education very late at the studied of 13 years, Veena has Studied Maths, Science, Account at school level & Commerce & Management at college level subject which are considered very difficult for blind persons & have been attempted by a few.

Veena is the first blind woman to have received offer of appointment as Officer in NTPC Ltd, the Maharatna Public Sector Unit.

Veena has participated in mountaineering, paragliding, horse riding & fashion shows considered a taboo for blind woman.

She has received four National Awards as role Model. These awards have been conferred by President of India, NIVH-Ministry of Social Justice & Empowerment, Ability Foundation and NAB India.

Veena is associated with NAB Delhi since 1989. We are proud to offer Veena Mehta Verma the NAB Delhi Award for Excellence.

2. Madhu bala Sharma

Madhu Bala Sharma receiving NAB Award of excellence born and raised in New Delhi, she studied through an integrated education system. National Association for the Blind (Delhi) was her resource school. Through NAB,

she completed her schooling and then went on to pursue graduation in English Literature from Lady Sri Ram College in Delhi University.

She started her professional career in the final year of college. She worked with GE Capital International Services. After graduating, she moved on to working as a software tester for 'JAWS for windows', screen reading software.

She has been working with Concentric, as a senior facilitator with the learning and development team. She has been a role model and encouraged many youngsters in colleges, NGOs, and corporate through her panel discussions, and talks.

She has received' The Role model award on the international day of persons with disability 2009, felicitated by the President of India Madhu has received Award of Excellence '2007 by National Institute for the Visually Handicapped Madhu has also been honoured by NAB India.

Madhu has been associated with NAB Delhi since 1986. We are proud to offer Madhu Sharma Kaushal the NAB Delhi Award for Excellence.

3. Diwakar Sharma

Diwakar Sharma receiving NAB Award of Excellence Diwakar Sharma performs Indian classical to Indian folk, Bollywood to gazals, devotional, Gurubani, Kirtan and all, but Yes! With a soul in it. Diwakar received Second position in the popular Zee TV programme SA RE GA MA Little Champs in 2006.

Diwakar has won laurels for his singing. However he has multifaceted talent. As a brilliant student of one of the most reputed schools of India, DPS, RK Puram, he has earned admiration for his intelligence, awareness, maturity, all of which are reflected in his singing. Apart of these activities he got 95% marks in class 12th CBSE Examination 2013 & now he is doing BA Honours in music from Hindu College.

Diwakar has had the honour of singing before such eminent personalities as the honourable President of India, Prime Ministers and legendary musicians. He has been invited to perform at places like the President House, British High Commission, Vigyan Bhawan where he received standing ovation many times.

Diwakar has been invited to perform by almost every TV channels. Diwakar went for world tour in November 2007 where he got standing ovation during every performance.

Diwakar had the privilege of becoming the Brand Ambassador of the NGO, Action Aid, Working for street children.

Diwakar is associated with NAB Delhi since the year 2000. We are proud to offer Diwakar Sharma the NAB Delhi Award for Excellence.

4. Kartik Sawhney

Kartik receiving NAB Award of Excellence, currently a fourth year Computer Science student at Standford University in the United States, Kartik Swahney is an all- rounder who has been recognised with several national and internationals awards for excellence in academics and contributions to the disability sector.

Untill 2011, Science, technology, engineering and mathematics were considered to be almost impossible for blind students in India.

However Kartik, being very passionate about the subject, challenged the status quo and become one of the first blind students in India to opt for this track. His efforts not only resulted in him securing the permission to study these subjects, but he also paved the way for other blind students excited about science across the country.

He is also very active in disability advocacy, and has been actively involved in working with educational institutions and universities such as the IITs and IIM's to make them more accessible.

In the US, he continues to excel in academics, and was recently recognised for excellence in computer science by Google as one of the eleven Google lime Scholars across the US and Canada.

In light of his achievements and work, he recently won the prestigious Queen's Young Leaders Award 2016, which was presented to him by her Majesty The Queen at the Buckingham Palace.

Kartik is associated with NAB Delhi since the year 2000. We are proud to offer Kartik Sahney the NAB Delhi Award for Excellence.

Case Studies

The following is a summary of my life in school so far and what I might intend on doing as a career.

I have been blind from birth. I was given too much oxygen gas when I was sick as a baby, as a result, the retina became detached in places and did not develop properly. My first education was when I started playschool

at the age of three. I settled in well in this school and I felt comfortable. I never noticed that I was blind nor felt any different. I moved to another playschool before starting in my local national school. I had no books, the technology was not there to help me. A visiting teacher came every month or two. I was not very good at Braille, but I was learning it.

I came to Dublin in 1989, when I was 5 years old. It was very hard leaving the family, and settling into a strange environment. As soon as I came to Dublin, I started to improve my Braille, and I started to improve my reading skills. I had a Brailler and books though some of them were extremely out of date. I learned at a slower pace than most average pupils and Braille was taught to me very gradually.

Problems that were solved in Dublin included, being able to read and write very fluently in Braille, to do mathematics in Braille format, and receiving a lot of attention because the classes in primary school were small. I took part in many activities such as music, horse-riding and swimming, not to mention ceramic sculpture.

I then went to Rosmini secondary school. In general I found the teachers helpful and good in Rosmini. The main difference here was that most teachers did not know Braille, but an advantage was that I was mixing with other sighted pupils. I did not have many books in first year. I feel that the books were changed too often, if the same books were used for a slightly longer time, then visually impaired pupils could have had a better chance to learn from them.

As I went through second year, improved technology was noticeable. There was more equipment in the school, books were becoming more available and I received a laptop. I think the laptop was a major help. It stored my notes in an organised way and it allowed me to learn and produce work quicker. With the introduction of more scanners and Braille printers, material such as tests and handouts, became transcribed into Braille much quicker. The invention of screen reading software means that I can use computers to help me. I can use a screen reader to help me with schoolwork and also to get a wide range of information over the internet.

Naturally there are some practical careers which I would not be interested in following, but with the ever-expanding Tele industries, and use of computers I feel there are more and more careers for a Visually Impaired person like myself to choose from. Who knows what technology will enable Visually Impaired people to do in the future? I do not know yet what career I would like to do, but what I do know is that there are a lot more jobs to do today than working behind a switchboard in the Corporation or local hospital.

Sonia is ten years old and is in mainstream education. He is totally blind, and he was beginning to find it hard to get information in school. He was relying on friends a lot for reading and homework, and he had no access to printed textbooks. John was then given a laptop computer for portability and a printer. A speech software package was installed on his computer to give him complete access to the machine. Since John needed to access printed text, he also used a scanner with adaptive scanning software. With this equipment John was able to have full access to printed text, access to a computer and was able to output printed text.

Kiran had just started secondary school. She had always been interested in computers, and owned a computer at home. She was finding it difficult to see the screen without straining her eyes. A magnification program was installed on her computer to increase the size of the text or image displayed on the monitor. As she often found it difficult to read large amounts of text, a screen reader which allows a document on screen to be 'read' out loud by the computer was also installed. She is now able to use her computer for longer periods of time and is able to access information on the computer more easily.

RPWD Act

MINISTRY OF LAW AND JUSTICE
(Legislative Department)

New Delhi, the 28th December, 2016/Pausha 17, 1938 (Saka)

The following Act of Parliament received the assent of the President on the 27th December, 2016, and is hereby published for general information:—

THE RIGHTS OFPERSONS WITH DISABILITIES ACT, 2016

(No. 49 OF 2016)

[*27th December, 2016*]

An Act to give effect to the United Nations Convention on the Rights of Persons with Disabilities and for matters connected therewith or incidental thereto.

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Whereas the United Nations General Assembly adopted its Convention on the Rights of Persons with Disabilities on the 13th day of December, 2006;

And whereas the aforesaid Convention lays down the following principles for empowerment of persons with disabilities, —

(a) respect for inherent dignity, individual autonomy including the freedom to make one's own choices, and independence of persons;

(b) non-discrimination;

(c) full and effective participation and inclusion in society;

(d) respect for difference and acceptance of persons with disabilities as part of human diversity and humanity;

(e) equality of opportunity;

(f) accessibility;

(g) equality between men and women;

(h) respect for the evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities;

And where as India is a signatory to the said Convention;

And where as India ratified the said Convention on the 1st day of October, 2007;

And where as it is considered necessary to implement the Convention aforesaid.

Be it enacted by Parliament in the Sixty-seventh Year of the Republic of India as follows: —

CHAPTER III

Education

16. The appropriate Government and the local authorities shall endeavour that all educational institutions funded or recognised by them provide inclusive education to the children with disabilities and towards that end shall —

    Duty of educational institutions.

    (i) admit them without discrimination and provide education and opportunities for sports and recreation activities equally with others;

    (ii) make building, campus and various facilities accessible;

    (iii) provide reasonable accommodation according to the individual's requirements;

    (iv) provide necessary support individualised or otherwise in environments that maximise academic and social development consistent with the goal of full inclusion;

    (v) ensure that the education to persons who are blind or deaf or both is imparted in the most appropriate languages and modes and means of communication;

    (vi) detect specific learning disabilities in children at the earliest and take suitable pedagogical and other measures to overcome them;

    (vii) monitor participation, progress in terms of attainment levels and completion of education in respect of every student with disability;

    (viii) provide transportation facilities to the children with disabilities and also the attendant of the children with disabilities having high support needs.

17. The appropriate Government and the local authorities shall take the following measures for the purpose of section 16, namely: —

    Specific measures to promote and facilitate inclusive education.

    (a) to conduct survey of school going children in every five years for identifying children with disabilities, ascertaining their special needs and the extent to which these are being met:

    Provided that the first survey shall be conducted within a period of two years from the date of commencement of this Act;

    (b) to establish adequate number of teacher training institutions;

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(c) to train and employ teachers, including teachers with disability who are qualified in sign language and Braille and also teachers who are trained in teaching children with intellectual disability;

(d) to train professionals and staff to support inclusive education at all levels of school education;

(e) 10 establish adequate number of resource centres to support educational institutions at all levels of school education;

(f) to promote the use of appropriate augmentative and alternative modes including means and formats of communication. Braille and sign language to supplement the use of one's own speech to fulfill the daily communication needs of persons with speech, communication or language disabilities and enables them to participate and contribute to their community and society;

(g) to provide books, other learning materials and appropriate assistive devices to students with benchmark disabilities free of cost up to the age of eighteen years;

(h) to provide scholarships in appropriate cases to students with benchmark disability;

(i) to make suitable modifications in the curriculum and examination system to meet the needs of students with disabilities such as extra time for completion of examination paper, facility of scribe or amanuensis, exemption from second and third language courses;

(j) to promote research to improve learning; and

(k) any other measures, as may be required.

18. The appropriate Government and the local authorities shall take measures to promote, protect and ensure participation of persons with disabilities in adult education and continuing education programmes equally with others.

Press Information Bureau
Government of India
Ministry of Social Justice & Empowerment

16-December-2016 18:28 IST

Rights of Persons with Disabilities Bill - 2036 Passed by Parliament

1. The Lok Sabha today passed "**The Rights of Persons with Disabilities Bill - 2016**". The Bill will replace the existing; PwD Act, 1995. Which was enacted 21 years back. The Rajya Sabha has already passed the Bill on 14.12.2016.

2. The salient features of the Bill are:

    i. Disability has been defined based on an evolving and dynamic concept.

    ii. The types of disabilities have been increased from existing 7 to 21 and the Central Government will have the power to add more types of disabilities. The 21 disabilities are given below:

        1. Blindness
        2. Low-vision
        3. Leprosy Cured persons
        4. Hearing Impairment (deaf and hard of hearing)
        5. Locomotor Disability
        6. Dwarfism
        7. Intellectual Disability
        8. Mental Illness
        9. Autism Spectrum Disorder
        10. Cerebral Palsy
        11. Muscular Dystrophy
        12. Chronic Neurological conditions
        13. Specific Learning Disabilities
        14. Multiple Sclerosis
        15. Speech and Language disability
        16. Thalassemia
        17. Hemophilia

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18. Sickle Cell disease

19. Multiple Disabilities including deaf blindness

20. Acid Attack victim

21. Parkinson's disease

iii. Speech and Language Disability and Specific Learning Disability have been added for the first time. Acid Attac Victims have been included. Dwarfism, muscular dystrophy have has been indicated as separate class of specific disability. The New categories of disabilities also included three blood disorders. Thalassemia, Hemophilia and Sick Cell disease.

iv. In addition, the Government has been authorized to notify any other category of specified disability.

v. Responsibility has been cast upon the appropriate governments to take effective measures to ensure that the person with disabilities enjoy their rights equally with others.

vi. Additional benefits such as reservation in higher education, government jobs, reservation in allocation of land poverty alleviation schemes etc. have been provided for persons with benchmark disabilities and those with bigger support needs.

vii. Every child with benchmark disability between the age group of 6 and 18 years shall have the right to free education

viii. Government funded educational institutions as well as the government recognized institutions will have to provide inclusive education to the children with disabilities.

ix. For strengthening the Prime Minister's Accessible India Campaign, stress has been given to ensure accessibility in public buildings (both Government and private) in a prescribed time-frame.

x. Reservation in vacancies in government establishments has been increased from 3% to 4% for certain persons or class of persons with benchmark disability.

xi. The Bill provides for grant of guardianship by District Court under which there will be joint decision - making between the guardian and the persons with disabilities.

xii. Broad based Central & State Advisory Boards on Disability are to be set up to serve as apex policy making bodies a the Central and State level.

xiii. Office of Chief Commissioner of Persons with Disabilities has been strengthened who will now be assisted by a Commissioners and an Advisory Committee comprising of not more than 11 members drawn from experts in various disabilities.

xiv. Similarly, the office of State Commissioners of Disabilities has been strengthened who will be assisted by Advisory Committee comprising of not more than 5 members drawn from experts in various disabilities.

xv. The Chief Commissioner for Persons with Disabilities and the State Commissioners will act as regulatory bodies and Grievance Redressal agencies and also monitor implementation of the Act.

xvi. District level committees will be constituted by the State Governments to address local concerns of PwDs. Details of their constitution and the functions of such committees would be prescribed by the State Governments in the rules.

xvii. Creation of National and State Fund will be created to provide financial support to the persons with disabilities. The existing National Fund for Persons with Disabilities and the Trust Fund for Empowerment of Persons with Disabilities will be subsumed with the National Fund.

xviii. The Bill provides for penalties for offences committed against persons with disabilities and also violation of the provisions of the new law.

xix. Special Courts will be designated in each district to handle cases concerning violation of rights of PwDs.

3. The New Act will bring our law in line with the United National Convention on the Rights of Persons with Disabilities (UNCRPD), to which India is a signatory. This will fulfill the obligations on the part of India in terms of UNCRD. Further, the new law will not only enhance the Rights and Entitlements of Divyangjan but also provide effective mechanism for ensure their empowerment and true inclusion into the Society in a satisfactory manner.

* * *

Sanjay Kumar/jk/MoSJ&E/16.12.2016

THE SCHEDULE

[See clause (zc) of section 2]

SPECIFIED DISABILITY

1.   Physical disability.—

A.   Locomotor disability (a person's inability to execute distinctive activities associated with movement of self and objects resulting from affliction of musculoskeletal or nervous system or both), including—

(a)   "leprosy cured person" means a person who has been cured of leprosy but is suffering from—

   (i)   loss of sensation in hands or feet as well as loss of sensation and paresis in the eye and eye-lid but with no manifest deformity;

   (ii)   manifest deformity and paresis but having sufficient mobility in their hands and feet to enable them to engage in normal economic activity;

   (iii)   extreme physical deformity as well as advanced age which prevents him/her from undertaking any gainful occupation, and the expression "leprosy cured" shall construed accordingly;

(b)   "cerebral palsy" means a Group of non-progressive neurological condition affecting body movements and muscle coordination, caused by damage to one or more specific areas of the brain, usually occurring before, during or shortly after birth;

(c)   "dwarfism" means a medical or genetic condition resulting in an adult height of 4 feet 10 inches (147 centimeters) or less;

(d)   "muscular dystrophy" means a group of hereditary genetic muscle disease that weakens the muscles that move the human body and persons with multiple dystrophy have incorrect and missing information in their genes, which prevents them from making the proteins they need for healthy muscles. It is characterised by progressive skeletal muscle weakness, defects in muscle proteins, and the death of muscle cells and tissue;

(e)   "acid attack victims" means a person disfigured due to violent assaults by throwing of acid or similar corrosive substance.

B. Visual impairment—

(a) "blindness" means a condition where a person has any of the following conditions, after best correction—

(i) total absence of sight; or

(ii) visual acuity less than 3/60 or less than 10/200 (Snellen) in the better eye with best possible correction; or

(iii) limitation of the field of vision subtending an angle of less than 10 degree.

(b) "low-vision" means a condition where a person has any of the following conditions, namely:—

(i) visual acuity not exceeding 6/18 or less than 20/60 up to 3/60 or upto 10/200 (Snellen) in the better eye with best possible corrections; or

(ii) limitation of the field of vision subtending an angle of less than 40 degree up to 10 degree.

C. Hearing impairment—

(a) "deaf" means persons having 70 DB hearing loss in speech frequencies in both ears;

(b) "hard of hearing" means person having 60 DB to 70 DB hearing loss in speech frequencies in both ears;

D. "speech and language disability" means a permanent disability arising out of conditions such as laryngectomy or aphasia affecting one or more components of speech and language due to organic or neurological causes.

2. Intellectual disability, a condition characterised by significant limitation both in intellectual functioning (reasoning, learning, problem solving) and in adaptive behaviour which covers a range of every day, social and practical skills, including—

(a) "specific learning disabilities" means a heterogeneous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia and developmental aphasia;

(b) "autism spectrum disorder" means a neuro-developmental condition typically appearing in the first three years of life that significantly affects a person's ability to communicate, understand relationships and relate to others, and is frequently associated with unusual or stereotypical rituals or behaviours.

3. Mental behaviour, —

"mental illness" means a substantial disorder of thinking, mood, perception, orientation or memory that grossly impairs judgment, behaviour, capacity to recognise reality or ability to meet the ordinary demands of life, but does not include retardation which is a condition of arrested or incomplete development of mind of a person, specially characterised by sub normality of intelligence.

4. Disability caused due to —

(a) chronic neurological conditions, such as —

(i) "multiple sclerosis" means an inflammatory, nervous system disease in which the myelin sheaths around the axons of nerve cells of the brain and spinal cord are damaged, leading to demyelination and affecting the ability of nerve cells in the brain and spinal cord to communicate with each other;

(ii) "parkinson's disease" means a progressive disease of the nervous system marked by tremor, muscular rigidity, and slow, imprecise movement, chiefly affecting middle-aged and elderly people associated with degeneration of the basal ganglia of the brain and a deficiency of the neurotransmitter dopamine.

(b) Blood disorder —

(i) "haemophilia" means an inheritable disease, usually affecting only male but transmitted by women to their male children, characterised by loss or impairment of the normal clotting ability of blood so that a minor would may result in fatal bleeding;

(ii) "thalassemia" means a group of inherited disorders characterised by reduced or absent amounts of haemoglobin.

(iii) "sickle cell disease" means a hemolytic disorder characterised by chronic anemia, painful events, and various complications due to associated tissue and organ damage: "hemolytic" refers to the destruction of the ccii membrane of red blood cells resulting in the release of hemoglobin.

5. Multiple Disabilities (more than one of the above specified disabilities) including deaf blindness which means a condition in which a person may have combination of hearing and visual impairments causing severe communication, developmental, and educational problems.

6. Any other category as may be notified by the Central Government.

DR. G. NARAYANARAJU
Secretary to the Govt, of India.

Rights of Persons with Disabilities Act, 2016

The Act replaces the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995. It fulfills the obligations to the United National Convention on the Rights of Persons with Disabilities (UNCRPD), to which India is a signatory. The Act came into force during December 2016.

Salient features of the Act

Disabilities covered

- Disability has been defined based on an evolving and dynamic concept.
- The types of disabilities have been increased from existing 7 to 21 and the Central Government will have the power to add more types of disabilities. The 21 disabilities are given below:-

  1. Blindness
  2. Low-vision
  3. Leprosy Cured persons
  4. Hearing Impairment (deaf and hard of hearing)
  5. Locomotor Disability
  6. Dwarfism
  7. Intellectual Disability
  8. Mental Illness
  9. Autism Spectrum Disorder
  10. Cerebral Palsy
  11. Muscular Dystrophy
  12. Chronic Neurological conditions
  13. Specific Learning Disabilities
  14. Multiple Sclerosis
  15. Speech and Language disability
  16. Thalassemia
  17. Hemophilia
  18. Sickle Cell disease
  19. Multiple Disabilities including deafblindness

20. Acid Attack victim

21. Parkinson's disease

- Persons with "benchmark disabilities" are defined as those certified to have at least 40 per cent of the disabilities specified above.

Rights and entitlements

- Responsibility has been cast upon the appropriate governments to take effective measures to ensure that the persons with disabilities enjoy their rights equally with others.

- Additional benefits such as reservation in higher education (not less than 5%), government jobs (not less than 4 %), reservation in allocation of land, poverty alleviation schemes (5% allotment) etc. have been provided for persons with benchmark disabilities and those with high support needs.

- Every child with benchmark disability between the age group of 6 and 18 years shall have the right to free education.

- Government funded educational institutions as well as the government recognized institutions will have to provide inclusive education to the children with disabilities.

- For strengthening the Prime Minister's Accessible India Campaign, stress has been given to ensure accessibility in public buildings (both Government and private) in a prescribed time-frame.

Guardianship

- The Act provides for grant of guardianship by District Court under which there will be joint decision – making between the guardian and the persons with disabilities.

Establishment of Authorities

- Broad based Central & State Advisory Boards on Disability are to be set up to serve as apex policy making bodies at the Central and State level.

- Office of Chief Commissioner of Persons with Disabilities has been strengthened who will now be assisted by 2 Commissioners and an Advisory Committee comprising of not more than 11 members drawn from experts in various disabilities.

- Similarly, the office of State Commissioners of Disabilities has been strengthened who will be assisted by an Advisory Committee comprising of not more than 5 members drawn from experts in various disabilities.

- The Chief Commissioner for Persons with Disabilities and the State Commissioners will act as regulatory bodies and Grievance Redressal agencies and also monitor implementation of the Act.

- District level committees will be constituted by the State Governments to address local concerns of PwDs. Details of their constitution and the functions of such committees would be prescribed by the State Governments in the rules.

- Creation of National and State Fund will be created to provide financial support to the persons with disabilities. The existing National Fund for Persons with Disabilities and the Trust Fund for Empowerment of Persons with Disabilities will be subsumed with the National Fund.

Penalties for offences

- The Act provides for penalties for offences committed against persons with disabilities and also violation of the provisions of the new law.

- Any person who violates provisions of the Act, or any rule or regulation made under it, shall be punishable with imprisonment up to six months and/ or a fine of Rs 10,000, or both. For any subsequent violation, imprisonment of up to two years and/or a fine of Rs 50,000 to Rs five lakh can be awarded.

- Whoever intentionally insults or intimidates a person with disability, or sexually exploits a woman or child with disability, shall be punishable with imprisonment between six months to five years and fine.

- Special Courts will be designated in each district to handle cases concerning violation of rights of PwDs.

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