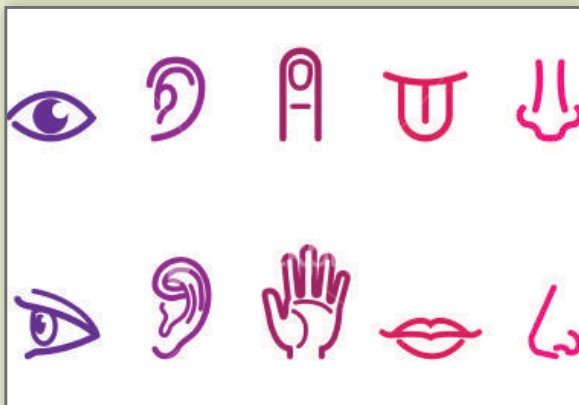
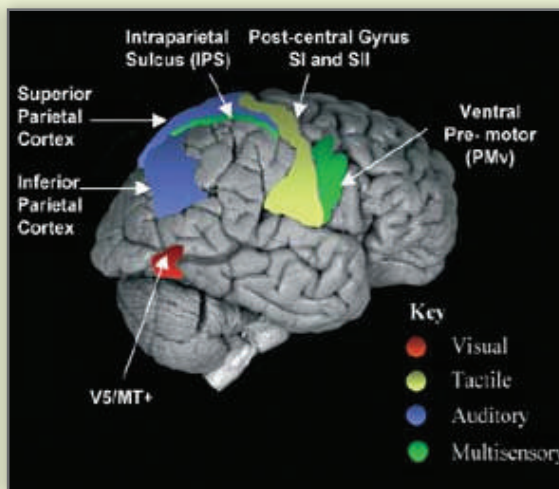
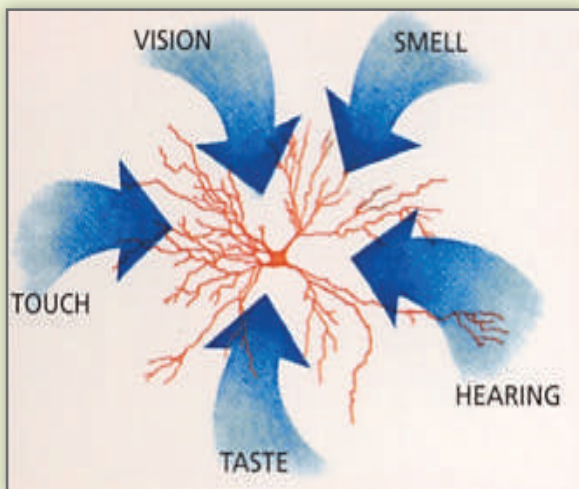


SENSORY INTEGRATION (SI)

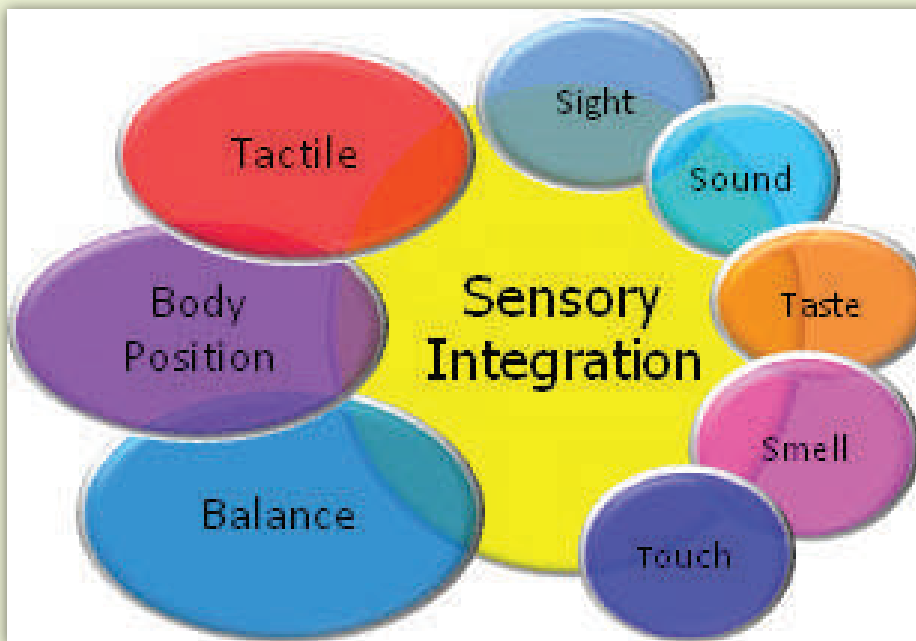
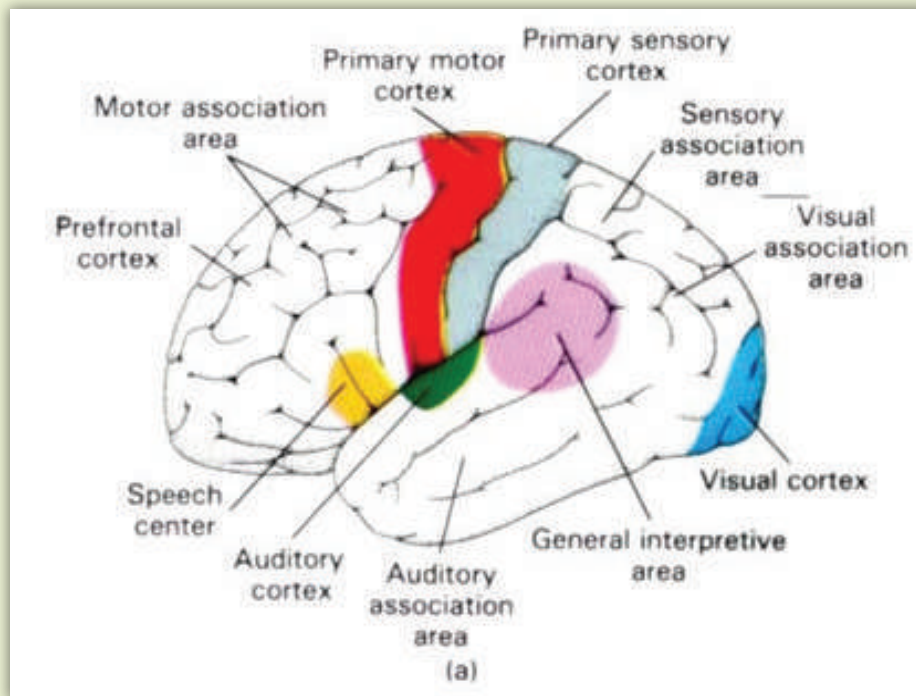
Sensory integration refers to neural processes through which the brain receives, registers and organizes sensory inputs for use in generating the body's adaptive responses to the surrounding environment-Jean Ayres,1989.

- a) *SI is necessary in order to able to use the body effectively within the environment.*
- b) *SI is the foundation that allows for complex learning and behavior.*
- c) *SI is founded on the following 7 senses: Visual, auditory, touch, smell, taste, vestibular (pull of gravity) and proprioception (body awareness and movement)*
- d) *Our brain takes in the information from the senses and uses it to form a full picture of who we are, where we are, and what is going around us. This picture can only be formed through the critical process of SI.*



Sensory organs of the body for 7 senses: Visual, auditory, touch, smell, taste, vestibular and proprioception

Ways to stimulate the various sensory organs



According to **Jean Ayres, sensory integration can be defined as “the ability to take in information through senses, to put it together with prior information, memories, and knowledge stored in the brain, and to make a meaningful response”.

Sensory integration is the process that organizes sensations received through the senses which come to the central nervous system, that should provide their processing and enable our usable functional outputs.

**Jean Ayres was known for her work in the area of sensory integration disorder and originally developed the therapeutic approach of sensory integration’

Brain's inability to process the information received through the senses is called **Sensory Integration Dysfunction.**

It manifests differently in each person. Therefore sensory integration therapy varies and adapts to each user individually.

The treatment is carried out in sensory room and is based on stimulation of the senses. This type of therapy is suitable for children with autism, concentration disorder, for those with sensory impairments, for children with mental development or insufficient development problems, speech difficulties, learning disabilities and behavioral problems

Some of the clues that the sensory integration is not taking place normally:

- a. I hate my hair being washed, brushed or cut
- b. I cry and shield my eyes from the sun or other bright lights
- c. I resist new foods and textures
- d. I seem to be unaware of normal touch or pain , I often touch others too hard or too soft
- e. I hate being tickled or cuddled
- f. I always walk on my tiptoes
- g. I have trouble focusing and/or concentrating
- h. I am overly sensitive to loud sounds such as vacuum and blenders
- i. I chew on every thing
- j. I have poor fine motor movements such as writing or cutting paper
- k. I have difficulty dressing my self
- l. I sit my legs In an "w" position
- m. I am always smelling people , food and objects
- n. I always want to put on my socks and would never go barefoot
- o. I avoid getting touched, refuse to wear certain clothing , covers his or her eyes or ears
- p. Oversensitivity or under sensitivity to movement sensation
- q. Unusual high or low activity level
- r. Problems of motor coordination may be awkward or seemly careless

Sensory integration dysfunction is often associated with:

- a. Autism spectrum
- b. ADHD
- c. Behavioral disorders
- d. Learning disability

Sensory integration room is a special room designed and equipped to stimulate the senses of hearing, sight, touch and smell. It is a place where children with sensory integration disorder can explore and develop their sensory skills, but also where they can relax and relieve their stress and anxiety.

A Sensory Room is a therapy space designed to stimulate the senses of children who have some neurological impairment or neurobehavioral disorders. It is a controlled space where light, sound, texture and even color are manipulated to reach certain areas of the brain to calm, focus or awaken the individual.

Sensory Rooms use colors to acclimate people to changing stimuli and to elicit predictable responses to certain colors. One way to conduct the therapy is to shift or change colors against a neutral background. The sensory room has been adapted for use in calming and retraining children with an array of sensory disorders. The rooms have proven helpful for complex-needs individuals. Sensory room design ideas may be also useful at home to administer the prescribed therapy.

The child is not told or shown what to do, but encouraged to have a natural response to stimuli from the environment.

What does sensory room look like? What kind of equipment can be found in this room?

Sensory Rooms should have soft padded floors and walls, mattresses and pillows in order to create the environment where children can not hurt themselves. **Atmosphere in the room should be such that every child feels safe and is given the opportunity to explore the space along with his abilities and limitations.**

Minimum space should be 15 feet by 8 feet. The walls, floor and the Roof.

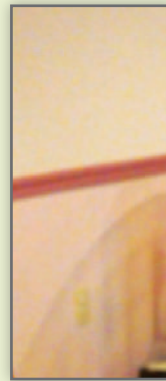
1. **Walls:** Sensory Wall Panels: should have a multitude of colors. On one side of the room the color should be light Blue (Sky color) or light green (garden color) on the other end of the room it could be bright yellow or bright red. The wall should have wooden paneling at places, mirrors at places, carpet and other clothes of various texture ranging from smooth to rough. On one side of the room, the wall should have only smooth textures and on the other side, both rough and bristly. Care should be taken that we need two different sensory panels- one for the hypersensitive child where we require smooth colors, smooth textures, soft lights while on the other, for hypo-sensitive child, where we require bright walls, rough bristly textures, bright colored lights and with tactile discs on the walls. Wall mirrors to be used on both side walls. Wall must have tactile disc as shown in the picture below.



Tactile Disc mostly in "Tactile and proprioceptive Zone"



Wall painted with neutral color



Wooden panel



Mirror mounted wall for both hyper-sensitive and hypo-sensitive children

Walls with grey color and the other light yellow with wooden paneling with different textures and mirror at places

2. **Roof:** Should have neutral color with mirror at places . It will have multiple hooks hanging from the ceiling for swings including chair swings, bolster swings, simple hammocks, tube and tyre swings, rope swings etc. The roof of the sensory room will be having three areas for different sensory components separated by curtains, though the whole room will function as a whole unit. This is to address the needs of both hypo and hyper sensitive children.

To understand the placement of hooks and other mounting devices the roof has been conceptualized into three zones:

- a. **Vestibular zone with different type of swings.**
- b. **Sensory Lighting or visual stimulation zone** with roof mounted LED Mirror Ball, Pincspot and Mirror Ball, Mirror ball motor –mains, Fire ball, sound activated light ,

Bubble tube (with LED light and vibrator) and speakers connected to the sound player (prerecorded sound of water fall, wind chimes, birds sounds and soft instrumental music)

- c. **Tactile and proprioceptive zone:** Ball pool with the corresponding ceiling or roof just above it should be mounted with Light Pod – 3 /6 way or a rotating mirror ball with changing colors to give the balls of the pool an added color effect. Other items in this zone are mini trampoline, sensory tunnel, therapy balls, big floor pillows, bean bag chairs and hammocks.



Roof with Hooks and swings on the **vestibular zone** of the room.

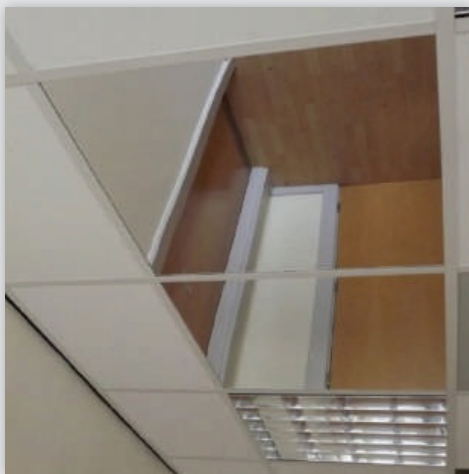


Care should be taken that the floor should have cushions and the distance between the child on the swings and the cushion should be for ground clearance only





Roof with wooden panel (black) on the Sensory Lighting or visual stimulation zone of the room with provision for roof mounted LED Mirror Ball, Pin-spot and Mirror Ball, Mirror ball motor –mains, Fire ball, and sound activated light. Other items in this zone include Bubble tube (with LED light and vibrator) and speakers connected to the sound player (pre-recorded sound of water fall, wind chimes, birds sounds and soft instrumental music) placed on the walls and floors .



Mirrored ceiling tile



Roof of Tactile and proprioceptive zone : Roof above the Ball pool has Light Pod 6 way or a rotating mirror ball with changing colors



Coloured net covering the ball pool



Mirror Ball Motor – Mains Mirror ball motor which can rotate any mirror ball up to 300mm in diameter



LED Mirror Ball: A battery powered motor that rotates a 200mm mirror ball.



Pin-spot and Mirror Ball Bundle Shine the pin-spot onto the mirror ball to create hundreds of mirrored reflections around the room.

Operates on mains voltage. 20cm ball and 15cm chain is to be provided



Fire ball mounted on the roof

3. **Floor:** SI Rooms should have soft padded floors, mattresses and pillows in order to create the environment where children can not hurt themselves. Atmosphere in the room is such that every child is safe and is given the opportunity to explore the space along with his abilities and limitations. Floor should have soft mattress, Pillows, bean bags, small chairs, wooden rocking horse, rope ways, soft toys, therapeutic balls, ball pools, textured tiles. Similarly Floor again has been conceptualized into three zones:
 - a. **Vestibular zone** with different type of swings.
 - b. **Sensory Lighting or visual** - auditory stimulation zone with roof mounted LED Mirror Ball, Pin-spot and Mirror Ball, Mirror ball motor –mains, Fire ball, sound activated light , Bubble tube (with LED light and vibrator) and speakers connected to the sound player (prerecorded sound of water fall, wind chimes, birds sounds and soft instrumental music)
 - c. **Tactile and proprioceptive zone:** Ball pool with the corresponding ceiling or roof just above it should be mounted with Light Pod – 3 /6 way or a rotating mirror ball with changing colors to give the balls of the pool an added color effect. Other items in this zone are mini trampoline, sensory tunnel, therapy balls , big floor pillows, bean bag chairs and hammocks.

Floor Design:



< Floor having bean bags, coloured soft mat, trampoline, ball pool, bean bag and swing



Rocking horse with mirror on the wall



< Mattress, bean bags , blocks, bolsters, therapy balls, trampoline, bolster swings, rope ladder

ACTIVITY- WISE LIST OF INSTRUMENTATION:

A good sensory room will have controllable light sources and light therapy. Most importantly, make sure there are absolutely no fluorescent lights (they are bothersome even to people without sensory processing disorders). A fluorescent lamp or fluorescent tube is a low pressure mercury-vapor gas-discharge lamp that uses fluorescence to produce visible light. An electric current in the gas excites mercury vapor which produces short-wave ultraviolet light that then causes a phosphor coating on the inside of the bulb to glow. Hence it is recommended to use LED lights for the stimulation purpose.

SL.NO.	NAME OF THE INSTRUMENT / ACTIVITY	ILLUSTRATION
VISION		
1	<p>Pin-spot and Mirror Ball Bundle/ Visual: Shine the pin-spot onto the mirror ball to create hundreds of mirrored reflections around the room.</p> <p>Operates on mains voltage. 20cm ball and 15cm chain is to be provided</p>	
2	<p>Mirror Ball Motor – Mains / Visual - Mirror ball motor which can rotate any mirror ball up to 300mm in diameter. Operates on mains voltage.</p>	

3 LED Mirror Ball/ Visual
- A battery powered motor that rotates a 200mm mirror ball.
Shines LED lights on top of the ball to create a pin spot type effect. Static or slow colour changing operation.



4 Fire ball mounted on the roof/ Visual- A rotating ball producing colourful spots of light. Operates on mains voltage.



5 Mirror Ball and Motor/ Visual- Shine a pin-spot on the mirror ball to create amazing effects within a room. Operates on mains voltage. Ball is anything between 20 cm to 30cm.



6

Sound Activated Light
/ AUDIO – VISUAL-
Lights respond and flash
to any noise you wish to
make.



7

OPTIC fibres / Visual- A
fiber optic light creates
a fabulous visual effect,
whilst being tactile and
safe to touch.

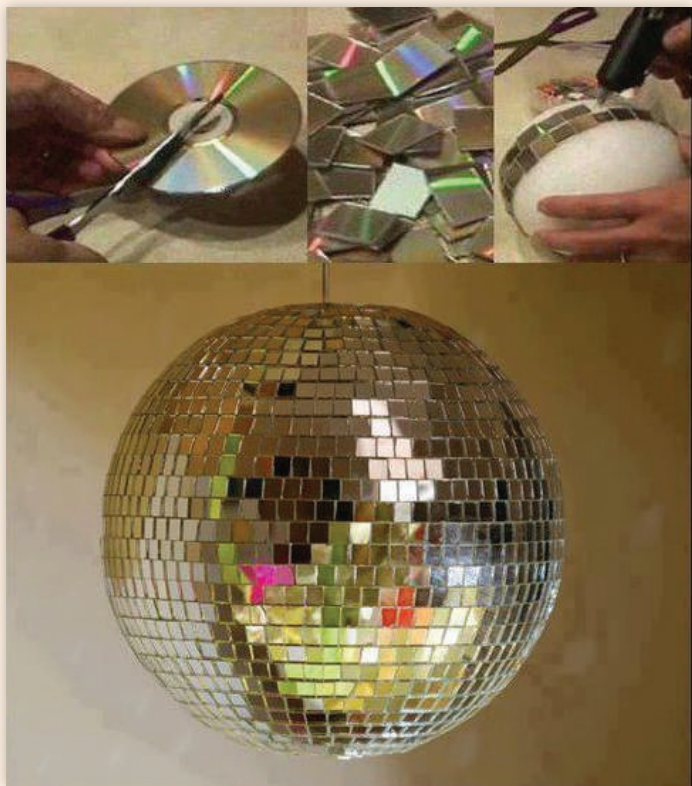
Calming or interactive,
fiber optics appeal to all
ages and abilities.

No electricity is present
in any fiber optic prod-
uct, only light meaning
they are inherently safe



8

Making of a mirror ball
/ Visual



9

Blue LED Lights: Visual
150 bulb blue LED light
chain Bulb Spacing: 7cm
Set Length: at least 8.4M
Bulb Type: Non replace-
able blue LED



10

Bubble Tube/ Visual:
The tubes are made
of thick acrylic plastic.
They are not glass. The
water inside bubbles
and the light changes
colors. The LED light
of Bubble tube should
slowly change colour
whilst small bubbles rise
continuously. Should
Operates on mains
voltage transformed to
low voltage. Minimum
Dimensions: 75mm
diameter x 500mm H.

Bubble tube with a vibrator and Led light which changes colours with mirror on two sides.



11

Aquascape: Twist Bub-
ble Floor Lamp Light
Colored. The tubes are
made of thick acrylic
plastic. They are not
glass. The water inside
bubbles and the light
changes colors



AUDITORY

- 1 **Rotating Drum:** A large drum containing brightly coloured balls and bells. Dimensions: 300mm L x 230mm D.



- 2 **Chime Frame and Beater:** Six colourful wooden chimes, suspended within a strong wooden frame. The beater is attached to the frame to prevent loss. Dimensions: 370mm L x 270mm H.



- 3 **Mirror Chime bout:** Strips of mirror Perspex faced with red and blue Perspex hang to create great visuals and sound at the slightest touch. Dimensions: 200mm D x 240mm H.



4

CD's, tapes, nature sound machines, indoor wind chimes, etc. Nature sounds, white noise, classical music, or new age music are the most popular choices for calming, organizing input.

VESTIBULAR

1

Trampoline



2.

Therapy Balls



3.

SWINGS:
a) **Bolster swing**
(1 small-30cm diameter and 1.2 meter long)



b) Platform swing



c) Tyre tube swing



d) Rope ladder swing



e) Rhythmic Rocking



f) Balance boards



PROPRIOCEPTIVE

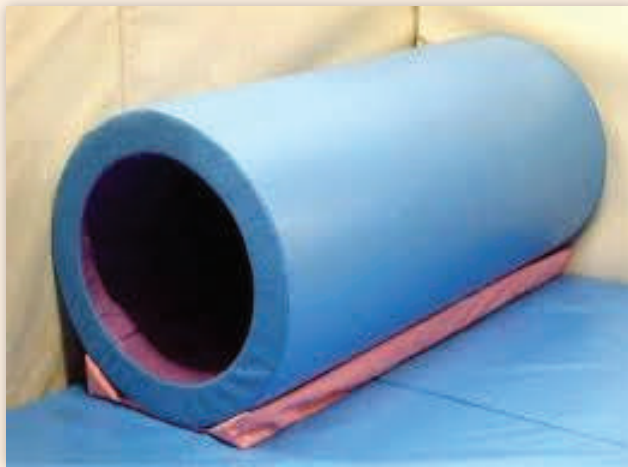
1

Ball Pool surrounded by a colorful net and roof above the Ball pool has Light Pod 6 way or a rotating mirror ball with changing colors



Tunnel

2





One can use therapy balls to roll on top of them, weighted vests and blankets, big floor pillows, lycra swings, and hammocks. Deep pressure input applied correctly and at the proper time will calm, relax, and soothe even the highest energy kids!

One may also want sensory room to provide opportunities for activities which give muscles and joints significant use and pressure. Some great ideas are: scooter boards, moon shoes, jumpolones, tunnels, hippity hop balls, mini trampolines, squeeze/fidget toys, and things to climb

SENSORY LIGHTING

Sensory environments can assist with mood enhancement, behaviour management and emotional well-being. One can use them for intensive interaction, sensory integration, cause and effect, exploring choice, improving hand/eye co-ordination and developing language skills. One may have a choice of sensory environments to specifically meet their requirements.



Sensory lighting is especially effective when used in storytelling or theming, helping create the desired atmosphere to bring the story to life. Sensory lighting is also great to use for teaching color recognition to children with sensory disabilities.

Sensory Room Projectors: **Sensory projection units** are one of the three essential components of a sensory room, used to promote relaxation as well as encouraging social interaction skills. A wheel rotator and projector to use this wheel.

Just above the ball pool on the ceiling one can have Light Pod – 3 / 6 way or a rotating mirror ball with changing colors

Other items on the walls & floor include Bubble tube, audio speakers with Player, bean bags, fibre optic sources and thick mat etc.

Schematic arrangement of the sensory Lightening or visual stimulation zone with roof mounted Mirror Ball, projector:

