

# Sensory Processing, Self-Regulation

Presentation for  
Connexions Resource Centre

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## GOALS :

- Self-Regulation and Sensory Processing
- Sensory Motor Preferences
- Different Strategies to help develop self-regulation and sensory processing
- Different sensory tools used to help with regulation

## SELF REGULATION

- The ability to manage stress.
- Refers to the neural processes that control the energy used to deal and then to recover from a stressor
- The ability to manage one's behavior (thoughts, emotions and actions) to respond to the demands of a given situation.
  - Self-regulation is essential to maintain attention and concentration.

## THE NERVOUS SYSTEM

The brain can be separated into three control systems:

- **Primitive instincts.** This includes the cerebellum and spinal cord. It controls our survival instincts such as breathing, heart rate and body temperature.
- **Emotional Control.** This is our limbic system; the "emotional brain". It filters the feelings of pain, fear and excitement under "pleasant or unpleasant" and adjusts its responses accordingly.
- **Cognitive control.** This includes the frontal, parietal, occipital and temporal lobe. It is described as the most advanced nervous system responsible for thinking and cognitive planning.

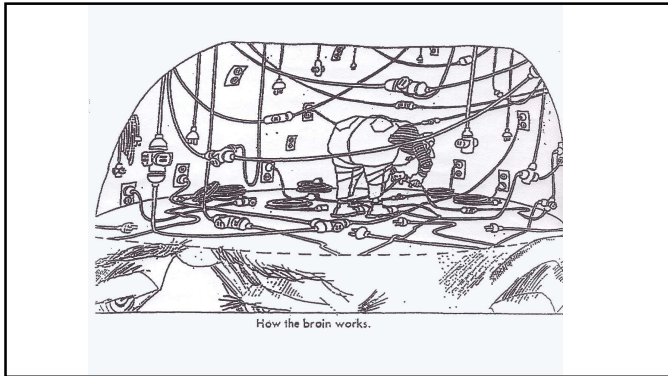
## THE EFFECTS OF THE NERVOUS SYSTEM ON SELF-REGULATION

Initially, the newborn uses the first order of self-regulation which consists mainly of the autonomic system and the limbic system. At this level, the regulation of breathing, temperature, sleep/wake cycles, muscle tone and survival reactions take place.

The second order of self-regulation then begins to develop when the baby begins to develop and access the senses (vision, hearing, speech and movement). As the baby develops his motor coordination to move and vocalize, he uses self-regulation strategies unconsciously.

## THE EFFECTS OF THE NERVOUS SYSTEM ON SELF-REGULATION

The development of the third order of self-regulation requires advanced cognitive skills. The cognitive control system helps to develop problem solving, planning, organizing and self-evaluation. This mainly includes executive functions.



### SENSORY INTEGRATION

“Sensory integration is the brain’s ability to interpret and organize information from the senses- vision, hearing taste, smell, touch, balance, gravity, position and movement.” Sensory Integration International

“Play is the work of children. Through play, children learn about themselves and the world around them. When all they see, hear, and feel makes sense to them, a process of sensory integration occurs.” (sensory integration international)

### BASIC SENSES

Touch  
(Tactile)

Smell  
(Olfactory)

Sight  
(Visual)

Hearing  
(Auditory)

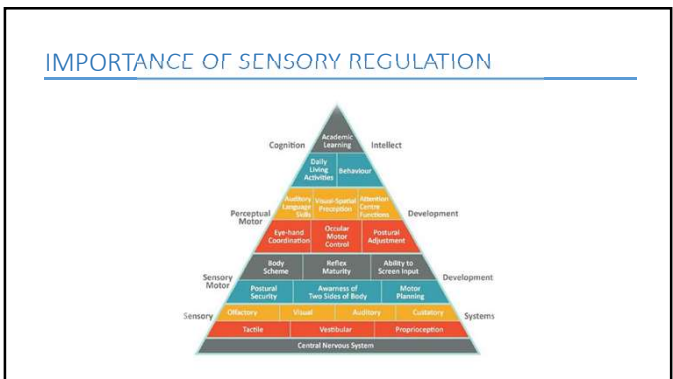
Taste  
(Gustatory)

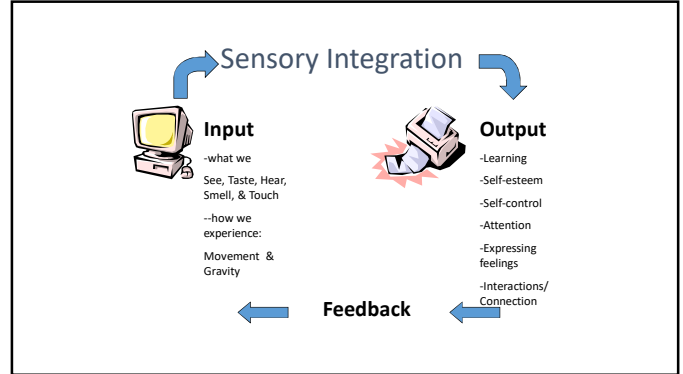
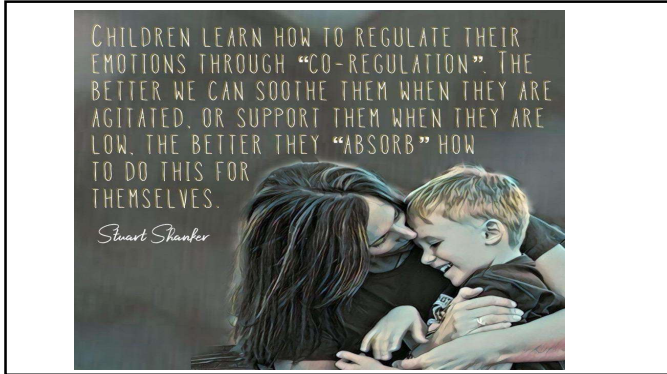
### “HIDDEN SENSES”

Sense of Balance and Movement  
(Kinesthetic)

Sense of what is going on inside our body  
(Interoception)

Input from Muscles and Joints  
(Proprioception)






**ROLES OF THE SENSORY SYSTEM**

- 1. Protection**  
 -Perception of a stimulus as "something" vs "nothing"  
 -Sensory information keeps us safe: Fight, Flight, Freeze
- 2. Discrimination**  
 -Sensory information tells us "What is it?"  
 -Helps us to learn about our world
- 3. Sensory Modulation/Regulation**  
 -Sensory information provides an appropriate level of arousal in the nervous system  
 -Essential to the development of self-regulation


**ROLES OF THE SENSORY SYSTEM**  
**Protection**

- Fight, Flight, Freeze Reactions are automatic responses to sensory stimuli.
- This system protects the us by:
  - Increasing heart rate, respiration and blood pressure,
  - Allowing the person to respond.
    - run away quickly, prepare to fight, freeze, or hide.




**ROLES OF THE SENSORY SYSTEM**  
**Discrimination**

- Sensory information provides detailed information about the environment.
- What is it?
- Important for learning.




**ROLES OF THE SENSORY SYSTEM**  
**Sensory Modulation**



- Modulation is the brain's regulation of its own activity
- Modulation provides a balance of arousal




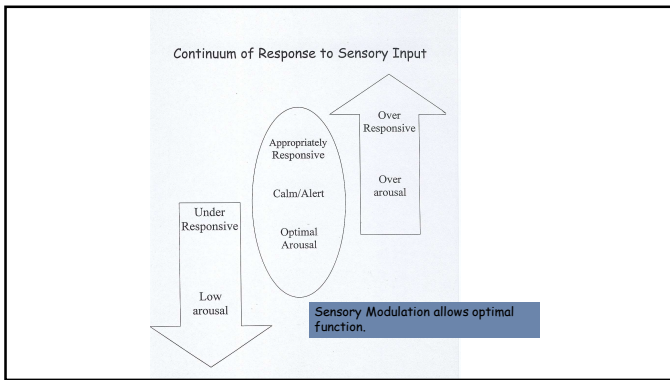
- ➔ Allows the child to focus on the meaningful aspect of a task or interaction
- ➔ Allows students to develop attention to task, impulse control, frustration control and a balance of emotional reactions



**Every move we make,  
Every response,  
Every word we say,  
is dependent upon what we take in  
through our senses.**

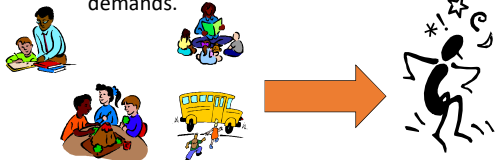
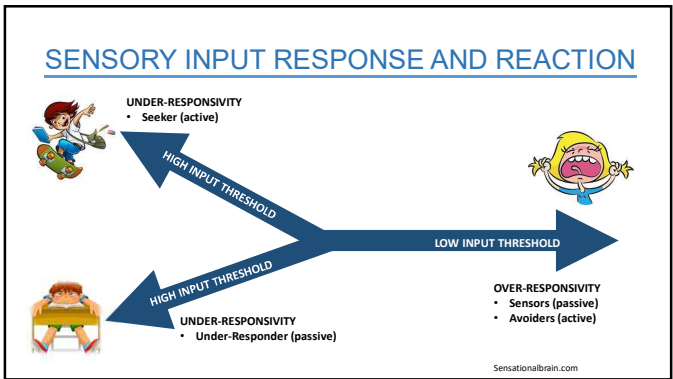
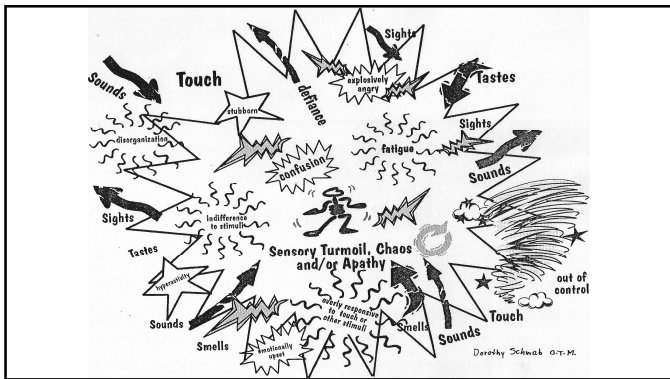



**BEEBLE BAILEY**

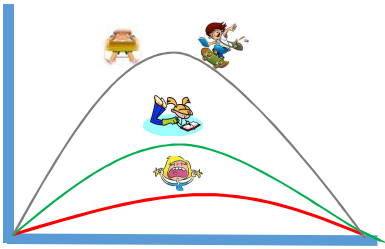



**SENSORY PROCESSING CHALLENGES**

Sensory processing difficulties occur when the brain is not able to organize sensory input to effectively meet environmental demands.

## SENSORY THRESHOLD



## SENSORY PROCESSING CHALLENGES

- When sensory input is disorganized/misinterpreted:

- A range of unexpected behaviours might be seen
  - Reactions range from acting out to shutting down
  - Distracted, hyperactive
  - Tactile sensitivities-avoid messy activities, tags, touches and sounds may bother the child
  - Fearful of heights and movement
  - Decreased response to injury
  - Slow to respond when spoken to
  - Emotional outbursts, hitting,yelling
  - Wants to leave room, task avoidance
  - Difficulty with personal space

## SENSORY PROCESSING CHALLENGES

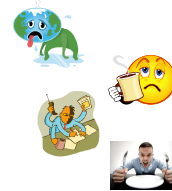
### Sensory Defensiveness

- Sensory defensiveness may occur when a student does not discriminate and/ or modulate sensory input accurately.
  - Sensitivity to touch, light, sounds, smells or movement
  - Minor sensory events can cause stress and anxiety
  - Highly distracted by sensory stimuli
  - "Everything bugs the child"

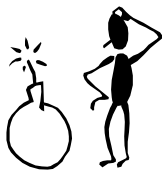


## OTHER FACTORS INFLUENCING SENSORY PROCESSING

- General health
- Fatigue
- Emotional Stress
- Hunger or thirst



## REFRAMING BEHAVIOUR CHALLENGES



Behaviour is communication, which the child can not put into words.

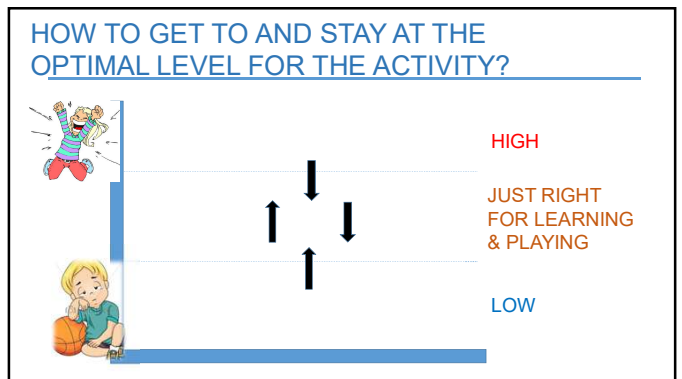
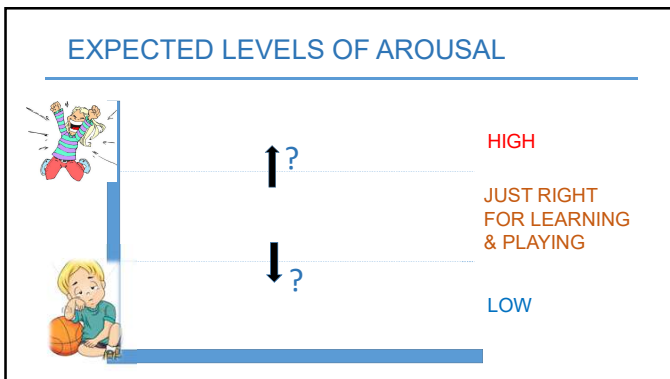
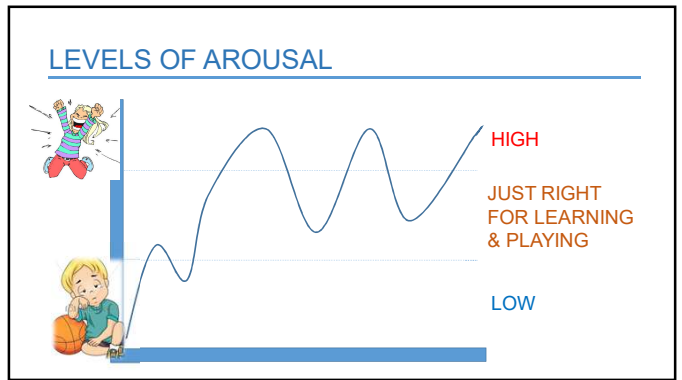
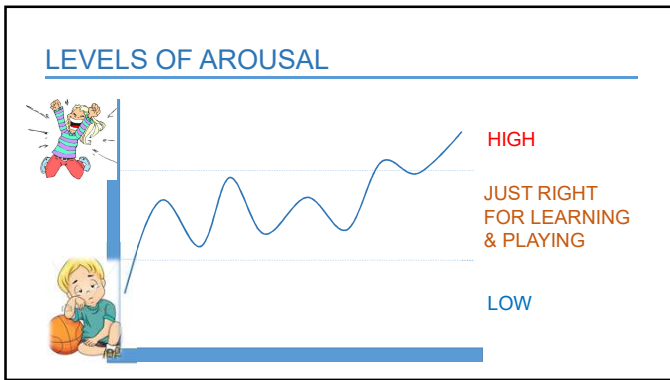
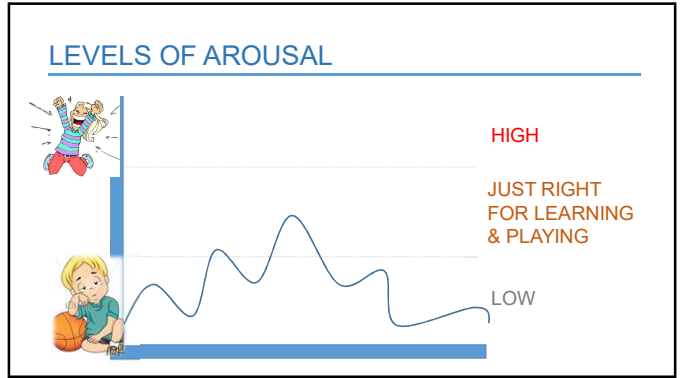
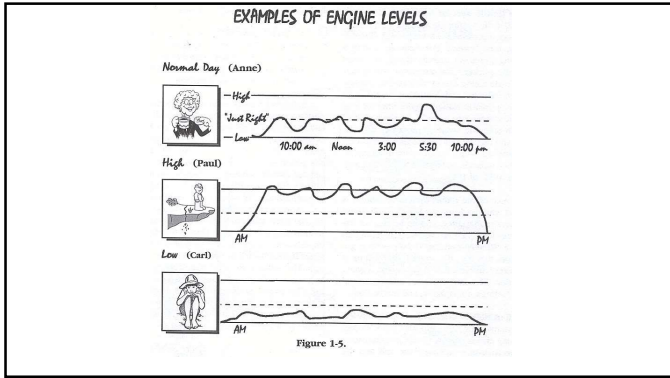
The child may be attempting to tell us that he is overloaded, wants your attention, he can't do the job or that he wants something.

A child's challenging behaviour is a problem to an adult.... to a child, it is a solution.

Lorna Jean King

On particularly rough days I like to remind myself that my track record for getting through bad days so far is 100%... and that's pretty good.

gocen.com



### CHANGING HOW YOU FEEL Sensory Tools!

1. Put something in your mouth
2. Move
3. Touch
4. Look
5. Listen

### MAKING SENSE OF YOUR SENSES

Sensory-Motor Checklist (for adults)

**SENSORY-MOTOR PREFERENCE CHECKLIST (FOR ADULTS)**

**HYPER-SENSITIVE TO YOUR SENSORY INPUTS (OVER-REACTS)**

- Visual: ...
- Auditory: ...
- Tactile: ...
- Olfactory: ...
- Gustatory: ...
- Vestibular: ...
- Proprioceptive: ...

**HYPERSENSITIVE TO YOUR SENSORY INPUTS (OVER-REACTS)**

- Visual: ...
- Auditory: ...
- Tactile: ...
- Olfactory: ...
- Gustatory: ...
- Vestibular: ...
- Proprioceptive: ...

**HYPER-SENSITIVE TO YOUR SENSORY INPUTS (OVER-REACTS)**

- Visual: ...
- Auditory: ...
- Tactile: ...
- Olfactory: ...
- Gustatory: ...
- Vestibular: ...
- Proprioceptive: ...

- Fill out the checklist
- Reflect on your sensory preferences
- We will share our responses as a group.
- Were your responses similar or different than your neighbour?
- Any surprises?

### SELF-REGULATION SCALES- HDYER

Mary Sue Williams and Sherry Shellenberger

### SELF-REGULATION SCALES- HDYER

### SELF-REGULATION SCALES- HDYER

### SELF-REGULATION SCALES- Zones of Regulation

Leah M. Kuypers

#### What Zone Are You In?

| Blue   | Green  | Yellow   | Red   |
|--|--|--|---|
|  |  |  |   |
| Sick<br>Sad<br>Tired<br>Bored<br>Moving Slowly | Happy<br>Calm<br>Feeling Okay<br>Focused<br>Ready to Learn | Frustrated<br>Worried<br>Silly/Wiggly<br>Excited<br>Loss of Some Control | Mad/Angry<br>Mean<br>Yelling/Hitting<br>Disgusted<br>Out of Control |



SELF-REGULATION SCALES- Zones of Regulation

### How do I feel?

|   |   |   |  |
|---|---|---|--|
|   |   |   |  |
| Sick/Unwell<br>Sod/Upset<br>Tired/Sleepy<br>Bored<br>Disappointed<br>Down in the<br>Dumps | Happy/Cheerful<br>Calm<br>Good To Go<br>Focused<br>Ready to Learn<br>Just right | Frustrated<br>Worried<br>Silly<br>Anxious<br>Excited<br>Embarrassed | Mad/Angry<br>Stress<br>Lost Control<br>I Need Time and<br>Space<br>Lost my Goal<br>Screening |

SELF-REGULATION SCALES- Zones of Regulation

|  |  |  |  |
|--|--|--|--|
|  |  |  |  |
| Blue<br>Calm<br>Good<br>Ready to Learn<br>Willing to Share | Green<br>Happy<br>Calm<br>Good to Go<br>Ready to Learn | Yellow<br>Frustrated<br>Worried<br>Silly/Playful<br>Anxious<br>Excited | Red<br>Mad/Angry<br>Stress<br>Lost Control<br>I Need Time and<br>Space |

SELF-REGULATION SCALES- Incredible 5-Point Scale

CHECK IN Kari Dunn Buron

|   |  |
|---|--|
| 5 |  |
| 4 |  |
| 3 |  |
| 2 |  |
| 1 |  |

SELF-REGULATION SCALES- Anger Mountain

Lynne Kenney

*Anger Mountain*

What I Thought | How I Felt | What Happened as I Escalated | What I Did to Calm Down

SELF-REGULATION SCALES- Zone'in

Cris Rowan

**Zone'in**

0 1 2 3 4 5 6 7 8 9 10

0: zoned out  
1: yawning  
2: bored  
3: disinterested  
4: listening  
5: distracted  
6: need to move  
7: frustrated  
8: charged  
9: hyper

SELF-REGULATION SCALES- Batteries

Quint, Nicole (2012). POWER! Batteries with visuals.

Low Battery  
Low Power

Charged Battery  
Ready to Learn

Power Surge!!!  
High Battery



## HOW DO WE HELP CHILDREN COPE WITH SENSORY PROCESSING DIFFERENCES?

- Help children recognize their own sensory processing patterns and needs.
- Adapt or modify the environment
- Teach children to manage their behaviours using a variety of self-regulation tools.

## VISUAL INPUT



### CALMING

- Reduce distractions: empty walls, use of sheets!
- Less intense lighting tends to be most calming...natural lighting
- Small spaces: cardboard box, tunnels, cozy quiet places

### ALERTING

- Bright sunlight
- Bright colors
- Glares
- Increased visual input on walls

## Tools for your eyes



Consider visual preferences/sensitivities-lighting, color, amount of visual stimulation.

- Tools/Strategies:
  - limit visual stimulation in the room
  - study carrel, "personal offices"
  - avoid florescent lighting, turn off/dim lights
  - use a tent, or calm area, "bunny hole"
  - watch calm visual objects

## More Visual Tools

- Visual Schedules
  - Pictures are cues
  - Assist with sequencing the tasks required
- Visual Timers
  - Helps with transitions
  - Goal setting...beat the red!



## AUDITORY INPUT



### CALMING

- Quiet, rhythmical, constant input
- Soft voice
- Reduce volume on TV or radio
- "white noise" to make environment neutral
- Personal tape player or headphones

## AUDITORY INPUT continued

### ALERTING

- Loud, fast or unpredictable sounds
- Music with strong beat
- Other children using musical instruments
- Sounds in the gym, busy classroom or public area (store)

## Tools for your ears



Consider volume, intensity, rhythm and pitch of sounds.

- Tools/Strategies:
  - ear protectors, ear plugs
  - headphones with preferred music or sounds music in the whole classroom (quick shifts, binaural beats)
  - go to the library or quieter work area
  - Prepare for or avoid fire drills, gym and assemblies.
  - Nature sounds outside or via headphones
  - Art work or fabric on walls to absorb sound

## SMELL INPUT- olfactory

*Smells tend to have a strong emotional link in our nervous system*

**Should be used CAUTIOUSLY!**

### CALMING

- Vanilla, banana, and coconut

### ALERTING

- Pine, citrus, and peppermint



## TASTE/ORAL INPUT

### CALMING

- Sweet tastes

### ALERTING

- Bitter and sour tastes

*Note: We have very specific taste preferences!*

### THE NEED TO CHEW

Sometimes our mouths need to move to help us concentrate!

### BREATH REGULATION

Deep rhythmical breathing supports self-regulation and helps to regulate our arousal system so that we are at a level "Just Right for Doing".



## Tools for your mouth



Consider oral needs -bite, suck, chew, blow

Taste preferences –sweet, sour, salty, spicy

### • Tools:

- gum, chewy food, soft pretzels, beef jerky
- popcorn, pretzels, dry cereal, carrots
- hard candy, suckers, drinking thicker liquids through straws,
- chewing on tubing or straws, "chewelry"
- Using a water bottle
- Bubbles, blow toys

## TACTILE INPUT



### CALMING

- Massaging hands and feet using lotion, expected deep pressure (within the right context)
- Touching, Fidgeting, Manipulating Objects
- *CONCENTRATION TOOLS – sometimes our hands need to move to help us think and focus*

### ALERTING

- Light touch arouses the sensory system
- Unexpected touch
- Tickling

## Tools for your hands



Consider texture and resistance.

### • Tools/Strategies:

- fidget tools such as squeeze balls, paperclips, keychains, smooth stones, rubber bands, putty, jewelry or "Koosh" balls.
- use tactile based learning activities
- fiddle with tape, place textured object in pocket, put preferred texture under the edge of the desk.

### MOVEMENT INPUT- vestibular

#### CALMING

- Familiar, rhythmic, slow movements
- Rocking: rocking chair, glide chair
- Swaying: swing, in lap
- Riding in the car



### MOVEMENT INPUT- vestibular

#### ALERTING

- Fast, unpredictable movement
- Jumping, bouncing
- Rough house play
- Spinning, merry go around, swinging



### INPUT TO MUSCLES AND JOINTS- Proprioceptive input

#### CALMING

- Heavy work
- Whole Body Pressure – hugs between pillows, hot dog roll, roll over body with ball, joint compressions
- Specific Trouble Spots – pressure or massage to scalp before combing, pressure on cheeks and jaw before brushing teeth
- Other tools: Body Sox, weighted tools, Theraband around legs of chair, swimming

### INPUT TO MUSCLES AND JOINTS- Proprioceptive input

#### ALERTING

- Jumping/bouncing – use a trampoline, mini trampoline, bouncy ball with handles
- Rough house play that involves firm contact – rolling together, squeezing, bouncing, crashing
- Quick muscle stretches
- Firm quick squeezes on arms, legs, trunk – use a puppet/stuffed animal and playfully “gobble them up”

### Tools for your body vestibular and proprioceptive input



- Consider movement needs- bouncing, rocking, swinging, jumping, heavy work.
- Consider the amount/intensity of input to muscles and joints.
- Tools/Strategies:
  - Use therapy ball, trampoline, scooter board, playground equipment.
  - Use movement breaks, walks, stretching, heavy work, hugs, squeezes.
  - Use movement cushion, weighted vest, lap weight.



### WHEN TO CONSULT AN OCCUPATIONAL THERAPIST

- If you are uncertain about your child's sensory processing needs and need more information. (assessment might help)
- You have tried some sensory strategies but need more ideas or feedback.
- Your child demonstrates some behaviours that you think might be related to sensory needs.