

# Why do children with special needs thrive in Montessori schools?

In the first of a new series of articles focussing on specific pieces of Montessori didactic material, **Wendy Fidler** explains how and why they work so well with children who have special educational needs.

**M**odern brain imaging techniques confirm what Dr Maria Montessori learned from continuous observation of the movements and abilities of children with all manner of social, emotional, physical and cognitive disabilities.

Montessori's response to her observations was to design, using everyday materials, specific pieces of apparatus to stimulate sensory-motor activities through which children's brains and muscles would work in integrated coordination, resulting in better self-regulation, social skills, confidence and independence in thought and action.

"It is exactly in the repetition of the exercises that the education of the senses exists; not that a child shall know colours, forms or qualities, but that he shall refine his senses through an exercise of attention, comparison and judgement." Maria Montessori

## The Pink Tower

The Pink Tower is the most famous piece of Montessori teaching and learning material and one which has the on-going all-age ability to help children understand concepts. Maria Montessori took butchers' everyday wooden weighing blocks and painted them pink to make the tower inviting to the child. Through the Pink Tower activities the child learns:

- In Casa – concepts such as big/large and small, heavy and light, smallest to largest and, just as importantly, the vocabulary to describe these concepts;

- In Elementary – concept of and vocabulary for cubing, formulas for volume and surface area, formula for building successive or non-successive cubes;
- In Secondary – concept of cube root of numbers to 10,000,000 or a concrete experience with calculus by creating a footprint of a solid moving through space by rolling a moving the cubes through a tub of sand or flour.

## How does the Pink Tower help children with special needs?

Reading, writing and calculating are not the basics of learning; these abilities require the brain to process very detailed sensations and engage in precise motor and mental responses. A brain does not function well if it cannot receive and process sensations from movement and gravity. Sensory-motor abilities are fundamental to brain function: learning disabilities flourish in schools which do not have a rich multi-sensory programme where children learn through movement.

The Pink Tower, as with all Montessori materials, is embedded with multiple physical concepts. Repeated use of the Pink Tower helps to stimulate the vestibular, proprioceptive and tactile senses which underpin healthy brain function:

- Vestibular – When a child spins around he naturally experiences dizziness on stopping; this is called nystagmus. If the nystagmus lasts longer than normal or if the child has no such experience, he is not processing vestibular input in at least one very important neural



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*Self-controlled well-coordinated tracking movements strengthen muscles necessary for reading and writing.*

pathway (synapse) and is probably deficient in other vestibular functions too. The child often has difficulties with sport, may be clumsy, may have fear of heights and falling, have difficulty dressing and difficulties with speech and language development and the ability to read and write. These difficulties are associated with dyspraxia - developmental coordination disorder, and dyslexia – where the vestibular system does not successfully maintain a stable visual field - things seem to flutter and move.

When the child collects the Pink Tower from the shelf, he faces the shelf, lifts one cube with both hands, turns and walks carefully to the mat or table and places the cube down. Ten times he centres himself at the shelf, uses both hands, turns and directs himself to his place of work. This repeated turning stimulates his vestibular sense. He is focussing his hands and his eyes on the cube and looking ahead to his work place as he



PHOTOS COURTESY OF HORSHAM MONTESSORI SCHOOL

*Building the Pink Tower, combining with the Broad Stair and innovative experiments of the child's own help develop vestibular, proprioceptive and tactile sense and a wonderful sense of joy and achievement!*

coordinates his walking movements back to his mat.

- Proprioceptive – Many children with minimal brain dysfunction have a reduced sense of proprioception. Imagine trying to drink from a cup, or walk across a room blindfolded; the proprioceptive sense is developed through muscle and joint movements and contributes to a child's 'body percept' i.e. the ability to understand where the body parts are in relation to each other and to things in the environment.

When a child picks up a cube of the Pink Tower he must squeeze the muscles of his fingers, hands, upper arms and upper body to stay connected with the cube as he turns to travel with the cube to his mat. The deep muscle and joint movements stimulate the child's proprioceptive sense, and the gradations built into the weight of the diminishing size of the cubes helps the child to refine this sense.

## The Insets for Design

The insets for design are probably the most useful piece of Montessori equipment for children of all ages. The multi-sensory use of the templates and insets involves hearing and saying the name of the shape, tracing the inner and outer edges of the shape with their writing fingers, positioning and holding first the template and then the inset steadily whilst tracing them with a choice of coloured pencils and finally filling in the outlines with ever-closer parallel lines. Imaginative, artistic, geometrical designs, sometimes crosshatched and interwoven, provide an ongoing record of children's progress in creativity, manipulation, visual orientation and concentration.

Children often tire of reading and

writing, not because they are bored, but because their hands and eyes are physically exhausted. The insets for design involve eye tracking movements from left to right across the 'mid-line' of the body whilst developing the muscles of the hands and eyes in preparation for reading and writing. Regular use of the Montessori insets for design often brings lasting benefits in learning for children with dyslexia, dyspraxia and concentration and behavioural problems.

### Summary

During the first plane of development – until about age seven – the brain is primarily a sensory processing machine. A child senses things and gets meaning directly from his senses. He does have thoughts and ideas about things, but he is primarily concerned with sensing them and moving his body in response to these sensations. (Ayes, 1998). The first seven years are spent adapting and refining responses, which are muscular (motor) rather than mental, during sensory-motor development. This is why Montessori encouraged children to 'work' with whichever material stimulated them and wherever – sitting or lying on the floor, or sitting or standing at a table – their sensory needs took them. Consequently, children in Montessori schools do not often develop learning difficulties because the activities promote good whole-body stimulation and sensory integration. ■

### Bibliography

- Ayes, A.J. (1998), Sensory integration and the child, Western Psychological Services, Los Angeles, CA, USA
- Fidler, W.B. (2005), Education Through Movement, The Dyspraxia Foundation, Hitchin, Hertfordshire, UK
- Goddard Blythe, S. (2005), The Well Balanced Child, Hawthorn Press, Stroud, Gloucester, UK
- Montessori, M. (1949), The Absorbent Mind,

## Brain Research THE FACTS

- A child's brain contains over 100 billion neurons – that's as many as there are stars in the Milky Way
- During a child's first years he will grow trillions of brain-cell connections
- By the age of three the toddler's brain had formed about 1,000 trillion pathways or synapses and is primed for learning – that's about twice as many synapses as adults have
- When a synapse is used repeatedly it becomes permanent
- A synapse used infrequently is lost
- Synapses that are not 'wired together' through stimulation are pruned and lost during a child's school years

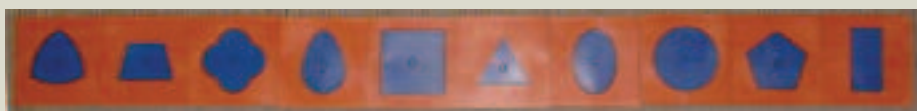
## How does Montessori Education fit with this?

- The rich multi-sensory stimulation received from repeated use of the Montessori didactic materials increases the chances that a toddler's synapses become correctly wired together
- In turn he will acquire rich language, reasoning and planning skills
- Children need extended opportunities to run, climb, jump, swing, pull, roll, bounce, balance, engage in supervised horseplay and generally leap about
- It is only by using their whole bodies to their physical limits that children learn to control and manage their bodies

Theosophical Publishing House, Madras, India  
 Montessori, M. (1912), The Montessori Method, F A Stokes Company Inc, New York, NY, USA

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*A completed inset for design gives practioners insights into a child's sensory strengths and weaknesses.*