direction

Montessori - the Pathway to Natural Development

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Contents

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From the Editor

Whether you are a parent, a Montessori teacher or just someone who is interested in children this edition of ***direction*** has much to offer to while away those long winter nights.

We talk about engaging children in their own development, but what does this really mean and how can we do it? **Nikki Hughes** helps us to think about our practice with the children and gives credence to the Montessori idea that development always starts with the connection between mind and body; a mind that we know is mathematical in nature and therefore needs a very specific kind of support in order to flourish. I hope that my article on **Supporting the Mathematical Mind** will help give those working with children under six some thoughts to reflect on their practice. In connection with this, in our regular feature Yesterday's Discoveries Tomorrow's Science Lori Woellhaf examines what mathematicians have to say about the Montessori maths materials.

Staying with the theme of the mind and as a prelude to the upcoming **2010 MMI Lecture Series** on the **Child in the 21st Century** we publish an article written by **Dr Steve Hughes** where he talks about why he thinks a Montessori environment is an ideal environment for brain-based learning.

With Christmas approaching we offer some advice for parents on toy management. You may be wondering how you will manage the onslaught of new toys and asking yourself whether your child really needs all these things. Well, of course Montessori has a solution to this problem as always.

Finally, but by no means least, we take a look at independence. **Like Father, Like Son** looks at how we can nurture independence in the early years and **Gayle Woo**d asks **'Maria'** how important is it, in a world where we are encouraged on a daily basis to fear for our child's safety, that we still continue to nurture independence as our children grow up.

Louise Livingston

News

Lymington Montessori School receives New Forest National Park Sustainable Development Funding

In June of this year the Lymington Montessori School were delighted to receive a £14,000 grant from the New Forest National Park Sustainable Development Fund. With this, they aim to create a natural wildlife garden and permanent bird hide, install a rainwater harvesting system, create a system for recycling 100% of their biodegradable waste, including cooked food, and to construct a compostable toilet and an outdoor wood-fired clay oven for cooking bread and pizza. Their new wormeries arrived in August, and the building of additional raised beds has already begun!

Lymington Montessori School farm has always played a huge part in enabling the children to carry out real Practical Life activities every day, retain their strong and innate connection to the natural world, and develop a real understanding of the cycle of production and where their food comes from. They are very excited about the developments that will be taking place over the coming year.

More Schools Continue to get the 'Kite' Mark of Montessori Quality

The following schools have been accredited with ME[UK] for over five years and have recently received their re-accreditation showing that they continue to have a high and sustained standard of Montessori practice:

The Montessori House, Muswell Hill**, Rainbow Montessori School** at West Hampstead**, Maria Montessori Children's House,** Notting Hill, **Maria Montessori Children's House,** Hampstead **and Clapham Montessori**

Montessori Education {UK] would also like to offer congratulations to the staff from the following Montessori schools for achieving their recent Accreditation with ME [UK]:

Morningside Montessori, Edinburgh **and Baytree Montessori,** Dorset

Congratulations to them all! A full list of schools that are accredited by ME[UK] can be found at www.montessorieducationuk.org

Maria Montessori Institute Launches Lecture Series

The Maria Montessori Institute launches their new Lecture Series with a series of talks given by the neurospychologist Steve Hughes. The Maria Montessori Institute Lecture Series aims to invite scientists from all disciplines to talk about their perspective of issues affecting the development of children. Dr Hughes' talks on 'The Child in the 21st Century' will be of equal appeal to parents, teachers and anyone interested in the needs of children in the 21st Century. You don't need to have any kind of Montessori training or experience to enjoy hearing the words of wisdom from this engaging and informed speaker. For more information: www.mariamontessori.org or 0207 435 3646

Maria Montessori Institute Announces New Courses

The Maria Montessori Institute is delighted to announce that they are now gathering interest for a possible **Elementary 6-12 AMI Diploma Course** to take place from the Spring term of 2011 and run in modules, finishing in the Spring of 2012. They are also planning a **3-6 AMI Diploma Course** to be run as a Summer Programme, starting this July. If you, your colleagues or friends are interested in either of these courses please contact us as soon as possible.

News

New School Opens in North West London

Lymington Road Montessori School opened its doors on 9th September. It marks the end of a three year search for premises by Elaine Wright who was determined to set up another Montessori school in the area, having been unable to find spaces for her children. The Head Directress is Donna Tuffs who previously worked at the Hampstead Children's House and in the state sector as well as being a Mum. They are also supported by Paul Pillai who trained and graduated with Elaine at the Maria Montessori Institute. The school started with four pupils but is growing steadily thanks to the support of the local community and the MMI, who is mentoring the school.

Lynne Lawrence Speaks to Neuroscientists

Lynne Lawrence, Executive Director of AMI, was recently invited to speak at the 3rd Biennial Conference on Brain Development and Learning in Canada – an interdisciplinary conference with speakers who are leaders in the fields of neuroscience, child psychology and medicine.

A quick survey of the speakers at the conference demonstrates how much current research offers support for Montessori: in his talk, Mihaly Csikszentmihalyi reiterated how Montessori environments seem particularly designed to support and promote flow experiences; Bruce McCandliss' word-building intervention appeared strikingly similar to the Montessori Movable Alphabet; Nils Bergman's research shows how early skin-to-skin contact with the mother immediately following birth, instead of incubator use, is more effective in enhancing newborn development.

Lynne's presentation was on Montessori Mathematics: from Pre-school through Pre-calculus. It was a timely reassertion of Maria Montessori's description of the tremendous mathematical potential in each child, a reassertion especially needed in this country.

Upcoming Events from Montessori Education [UK]

As part of its commitment to raising the standard of Montessori practice in schools ME[UK] provides a programme of continual professional development for Montessori teachers. Next year the ME[UK] conference will be held on the 14th May and will address the **Montessori Continuum from Birth to Adolescence** bringing together speakers with experience of applying the Montessori principles with children in each of the planes of development. Whichever age children we are working with it is essential for us to know where they have come from and where they are going to. This conference is open to anyone who is interested but special discount is offered to **'Friends of MEUK'**.

ME[UK] also runs a special day every year for all the schools that have been accredited by them because they believe that Montessori Accreditation does not stop when the school receives its plaque. In fact, this is just the first step on a pathway that will take each school to continual improvement of their Montessori practice. This year's Accredited Schools Day, which is free to schools that have been accredited by ME[UK] will address '**Observation as a Key to Development'** and **'The Role of the Keyworker'** and will be held at the Maria Montessori Institute on the 29th January.

For more information about either of these events and also to find out how to get your school accredited by ME[UK] please visit www.montessorieducationuk.org

Your Letters >> Answered by Emma Wong-Singh

Does the new Government think the EYFS is too rigid?

I read recently that Sarah Teather, the Children's minister, has announced that there is to be a wide-reaching review of the EYFS because she feels that it is overly rigid and puts too many burdens on carers and teachers to tick boxes rather than spend time with the children. What do you think about this?

At the moment there are 69 'early-learning goals' that four-year-olds are expected to master by the time they start school. This is a statutory requirement of the EYFS and Sarah Teather is quite rightly keen to look again at whether young children's development needs to be formally assessed and also to consider what the latest evidence tells us is the best developmental approach for children. The Montessori movement welcomes this kind of thinking. **Sue Palmer**, president of the Montessori Society AMI UK, has made the following comment:

British children have always started school at five, earlier than other European countries, where the starting age is six or seven. But that first 'reception' year used to be a settling in time, when children learnt – as their brains are naturally primed to learn – through play, stories, music and art.

As our natural culture grew ever more competitive, it was easy to convince parents that an early start was a good thing. In a dog-eat-dog world, no one wants their child to be 'left behind' or 'held back'. So over the last fifteen years we have seen children required to start on formal approaches to reading and writing when they are five, four and sometimes even three years old. Many therefore fall at the first fence in literacy learning and, sadly, catch-up programmes do not seem to work.

I believe this is a key reason behind our country's inability to reduce 'the long tail of underachievement', especially in areas of deprivation, despite the huge investment of recent years. Increasing numbers of children now arrive at nursery or primary school with poorly developed speech, attention and social skills. Many have had few life experiences beyond watching TV. This means that there is much ground-work to be done before they're able to read and enjoy books, wield pencils and understand what writing is about.

Our early start also often causes a problem for boys, who tend to be developmentally behind girls. They need opportunities to develop their spoken language and plenty of active play to develop physical control and co-ordination they'll need for writing. If pushed to achieve skills that are developmentally beyond them, they can be put off for life.

In Finland, which does best in international studies of literacy, children follow a personally tailored, play-based 'kindergarten curriculum' until they are seven. Children are encouraged to read and write and supported in their interests and efforts, but as individuals (as they would be in a caring family home) not in a 'schoolified' way.

We should follow the Finns' example and focus on the importance of outdoor play, music, song, stories, art and drama in early learning and the need to respond to young children's developmental needs, rather than enforcing a top-down educational model at an early age. Raising the school starting age to six [or even seven] and providing a 'kindergarten' stage from the age of three would give all children a better chance of achieving a good standard in literacy.

It would also send a very strong message to parents and the general public about what really matters in early childcare and education, and the social, emotional and physical basis of a 'good childhood'.

Comments, Suggestions?

Please send in your letters to:

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Is the iPad an appropriate learning tool for our children?

I was interested to read that Apple have brought out an iPad App using Montessori techniques to teach children numbers and letters and that this is aimed specifically at toddlers. Do you think this is appropriate for use by children of this age?

Actually, Montessori actively seeks to disassociate itself from these kinds of product. Firstly, as you will have read here previously, we do not condone the use of screen based learning for children of this age, who need hands-on experiences. At this age children are trying to develop a connection between their hands and their minds. When children tap a screen to move things around it gives them an unrealistic view of this connection, and the pathways that connect up in their brain as a result of this kind of activity are not helpful for their real lives. Secondly, these applications suggest that Montessori is about mathematics and learning to read and that somehow a toddler can get the full benefit of Montessori through a screen. The impression being given to those who know no better is that Montessori is an academic learning programme for young children rather than an approach to life that can help children to develop into confident, self-reliant, independent and highly socially adapted human beings.

As we know, this does not come through the screen of an iPad – however alluring it may be.

Will the Government's plan to set up free schools in England be an advantage to Montessori schools?

I have been reading with interest about the government's new plan to set up free schools and I have been wondering how many Montessori schools will be taking advantage of these reforms?

Free schools are a flagship part of the new Government's reforms to education in England.

They allow groups of local parents, teachers or charities to establish their own school and choose their own pedagogy. Like academies, they'll be outside local authority control and will receive money directly from the Department for Education. They will have substantial freedom to set their own ethos and subject specialisms. This obviously seems very appealing to those of us in the Montessori movement who have long regretted the fact that Montessori is mainly available to those who can afford it and that in the very few number of state Montessori schools that exist compromises have been made. We know of several school owners who are presently making applications to set up free schools. However, it also seems a little too good to be true. It seems unlikely that the government will allow the kind of freedom they are suggesting. How will they assess whether the schools are a success or not? This will have to be done by measuring the children's progress and as soon as standard tests are devised to measure children's progress we are back in the same situation of teaching to a curriculum. So whilst the Montessori movement welcomes the initiative, we are also waiting to see whether it is really going to give us the freedom to practise authentic Montessori unfettered by government restraints.

Book Review

Understanding Montessori – A Guide for Parents by Maren Schmidt

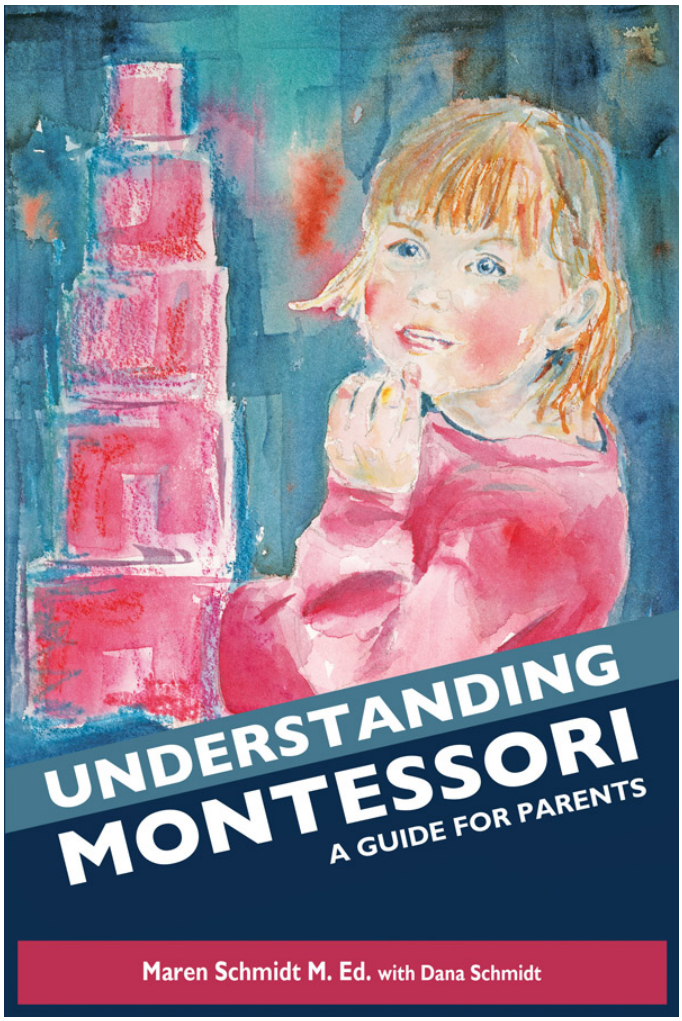
With this recent publication Maren Schmidt gathers upon her full-range of Montessori experience to help parents better understand what, how, and why a Montessori education is the appropriate choice for children of all ages. As a parent, and as an authentically-trained Montessori teacher, as well as a Montessori school founder and administrator, she is able to 'see' what it is parents need in order to reach an informed decision about their child's education.

'Understanding Montessori' is exhaustive in its approach, and is a resource any Montessori school can rely upon for insights and guidance in helping parents, and potential parents, better understand what to expect from their child's Montessori experience. The book's thoroughness may be too broad for the casual parent browsing for simple explanations, but for diligent parents striving to know what it is about Montessori philosophy and practice that makes it so special, Schmidt's book provides clear and comprehensive information.

In fact, the completeness of the book's content will likely provide the basis for ongoing discussions within Montessori school communities, parent education programs or events, and even book-club type readings as the basis for group discussions with parents, teachers, and administrators.

Additionally, Schmidt sprinkles chapters with quotations and perspectives from Dr. Maria Montessori, a gentle reminder of how timely Montessori's work continues to be.

'Understanding Montessori – A Guide for Parents' is an essential resource for every Montessori school. Importantly, Montessori teachers and administrators who read the book will better be able to respond to the questions and concerns parents may have. Parents who read the book will be better able to comprehend and supplement their child's experiences within their Montessori classrooms, and that will mean everyone benefits from Schmidt's efforts—informed, supportive, committed parents,



with happy children creatively learning in schools meeting the needs of the children, the parents, and the teachers…Schmidt's book is part of this 'portrait' of success.

Jim Fitzpatrick - *the founder and Head of School at Santa Barbara Montessori School, an AMI school on the California coast.*

This book and a range of other books about Montessori are available from the Montessori Society AMI UK.

These can be viewed at www.montessori-uk.org

The Meaning of Engagement

As Montessori teachers we know that we are supposed to engage children in their own development through our presentations but sometimes it is not always as easy as that sounds. ***Nikki Hughes****, AMI Teacher Trainer, offers her view that true engagement always starts with movement and our task is to find the point of contact for that to happen.*

In nature's plan adults have responsibilities not only for the wellbeing of the newborn, who is extremely dependent, but also for the young child, the older child, the adolescent and youth as development progresses through the four planes. In general terms we classify these responsibilities into three categories. Adults must provide nurture, protection and stimulation for the whole child, his physical body and his intellective soul.

How do we do this? We observe the child and study human development. We prepare the environment for human development. We offer the environment and help the child become engaged. This includes removing obstacles that hinder engagement. We withdraw, leaving the child free to act of his own accord. We continue to observe and study.

With many children offering an element of the environment is not enough and helping the child to become engaged is our great challenge. Dr. Montessori recognised both the importance and challenge of engagement. She noted that often it is not enough simply to offer the environment and invite the child to activity. She said there are times when we must encourage the child. We must entice him or even seduce him to become involved with a material. In this effort we do well to remember that our job is to give aid to life unfolding.

> Movement is creative when it requires real effort by the child and brings together thought and motor activity

Therefore, we must do for the child what he cannot yet do for himself, but we must refrain from doing for the child what he can do for himself. Above all, we must help the child to make a point of contact with the outer world that meets his developmental needs and thus enables him to become engaged. When engagement occurs it must be protected assiduously for it may be fragile and tenuous. Let us now review some of the details regarding the child and engagement. The adult will offer an element of the environment that is appropriate for the child according to the tendencies and sensitive periods as well as the child's ability level. The child's interest will be aroused and the presentation will show the child what to do. Then the child is given an opportunity to work on his own. It is in his individual work that the child becomes engaged. We see this in concentration, in spontaneous repetition and in obvious effort on the part of the child.

For the young child the key to engagement is movement. Dr. Montessori saw movement as a biological need driven by the hormé. Although movement helps in the acquisition of knowledge it does much more than that. We all know that the child who is in the constructive stage of development is always moving. As Dr. Montessori said, 'We must give no more to the eye than we give to the hand.' Why? It is because in movement there is a union between the ego and its acts. If the child does not act as a whole person, with the mind and body in union, the result is fatigue and loss of interest. Without interest there is no engagement.

The value of movement comes from the result of the movement. This could be either the perfection of the co-ordination of movement or the perfection of a mental capacity or both. Here we see the importance of the analysis of movement by the adult. This gives the child a clear view of each movement and the flow of movement. Yet presentations must show how the movement is done without calling for imitation. The child must not copy the movements shown but must originate his own. Movement is creative when it requires real effort by the child and brings together thought and motor activity. The intelligence must be fixed on the purpose of the movement and not on the movement itself.

Montessori had a name for this creative movement; she called it synthetic movement. This kind of movement is found in the Practical Life Exercises of the class and in similar activities at home. Synthetic movement is 'movement ordered and directed by the mind to an intelligible purpose.' In short, it is purposeful movement. This kind of movement is a must if we are to bring the child along the path of what Montessori saw as 'progressive incarnation'; that is the building up of the physical instrument that will be used to express the personality as it unfolds. It is synthetic movement that leads to engagement.

In the class it is most often in the purposeful movements of the Practical Life Exercises that engagement first occurs. One of my favourite stories from the classroom illustrates this. A sturdy little boy just over two and a half years had entered the class. The directress was experienced and knew he would need lots of presentations in order to find one that would engage his full effort. She began, as usual, with some of the preliminary exercises. It was hard to get this boy to focus on the presentation and as soon as he was on his own he left the material and was off around the room disturbing others and taking anything that struck his fancy from the shelves. The teacher's carefully chosen and given presentations and the boy's disruptive behaviour continued for more than two weeks. Finally, the teacher said to herself at the end of one day, 'Tomorrow he will work.'

Washing a table was the chosen activity and the next day the directress proceeded to present it to the little boy. She invited him enthusiastically to the shelf. She carefully directed him and together they got the material and laid it out. Then she started the presentation and reached the point where she was applying soap to the tabletop. The boy, however, was looking elsewhere and trying to run off. After several efforts to get the child's attention focused on the activity had failed the teacher had an inspiration. She put the child's hand on the brush and put her own on top of his so he could not take it off. She continued the broad circular movements

with the brush that swirled the soapsuds over the surface of the table. All he could see was the tabletop and the hands moving the brush over it. The application of soapsuds continued. After a few moments the teacher felt the little hand under hers begin to move the brush. As the boy's efforts grew stronger the teacher relaxed her grip and slowly removed her hand from the brush. Then as the child continued swirling the soapsuds on the tabletop she removed herself. Finally, the little boy was engaged.

We must, of-course, be very careful how we handle children and this was an extraordinary solution. It did, however, follow the dictum that we must do for the child that which he cannot yet do for himself. It also recognised that it is most likely the link with the environment will come through movement for the young child.

Although there are several materials and many steps in the exercise for washing a table it remains one of the most effective activities for helping an unsettled child to become engaged. A dry floor or a forgotten step is never more important than engagement.

Reality is another important factor for the arrival of engagement. The mind constructs itself through contact with reality, not by absorbing fantasy. Because of television and computer programs the intrusion of make-believe into the lives of young children is very great. Teachers everywhere are contending with the results of this.

One extreme example of which I have heard is that of a boy whose parents had introduced him to a TV character known as the Hulk. The child watched endless episodes of this program and began to imitate the character. Thinking this was clever the parents gave their child a great deal of positive reinforcement for this behaviour. They encouraged it by buying him all the DVDs, books, and paraphernalia sold commercially. When the boy entered the Montessori class he continued acting out. Hulking around the classroom he was noisy and disorderly. He scared the other children. No one

wanted to be near him. He was not interested in any presentation, but was always trying to get a positive response to his hulking. He could talk of nothing else. This experienced and patient teacher tried for two years to find a way to get the boy constructively involved with the environment but without results.

From the beginning the newborn begins to build up his intellect from all the impressions of the external world he is experiencing through movement and his senses. Knowledge of all the real paths of culture enables the child to construct a person who can function in it. Acquisition of knowledge about the real world continues throughout the first plane from the child's explorations and movement. Later, in the second plane, knowledge is gained by reason and imagination as well as from actual experience. Absorption of experience in the first plane builds the personality and fills the mind with facts. These facts are elaborated by the researches of the older child. To function as it should and to grow in knowledge the intelligence of the human being must work with reality.

Another factor affecting engagement is that of free choice. It is this that makes an activity an act of the child's total personality. Activity in response to a command from an adult, be that parent or teacher, does not engage the child's own ego and his personality does not function as a unity.

Herein lies a challenge for the presenter. How can the directress draw out action by the child in a way that will not interfere with spontaneity? A child who constantly acts at the behest of the teacher, or even from just her suggestion, is not directing his own effort. His own psychic activity may fade away and even disappear under the stronger will of the adult. We already know that substitution of the adult's will for that of the child is a cause of psychic deviation. This is a point not always easily seen because, of course, we want the child to be active for the sake of his own development. However, the activity must originate in the child's psyche if the unity of psychic life and motor forces is to be maintained. The young child choosing to do and then actually doing the activity is the constructive engagement we mean by the word 'work'.

The origination of the child's activity is a good point to check when assessing a child's use of the environment. How often does the child choose something to do from his own true interest? It is when a child chooses and engages with one piece of work after another that he is following the natural path for healthy construction. And yet, we must never cease to offer the environment to the one who has not yet become fully engaged. Remember that a child who takes material and then fiddles with it, or even operates it more or less as it was shown, is not truly engaged.

Next let's consider Montessori's concept of the centre and periphery and her directive to serve the periphery. The centre is the innermost aspect of the human personality from which action proceeds. The mental powers at the centre grow as the child explores the environment experiencing new sensations and movements. The exploration is, of-course, done at the periphery, the part of the child's personality that comes into contact with the external world. It involves the senses, movement and the manifestation of choice.

Continuous interaction between the centre and the periphery under girds development of the mind. This on-going engagement with the environment leads to an unfolding and expansion of the mind. In this way the mind creates itself. The process is this: The senses are stimulated and take sensations from activity with the environment; the quivering readiness at the centre responds with an unfolding toward the source of the sensation. This phenomenon is hard to express in words, but can be seen as a kind of grasping of the sensation. A stimulus brings forth a response that leads to a choice that results in an action. Choice is then revealed in an outward manifestation.

In the class sensorial stimulation leads to a choice that is followed by an act of will guided by the inner powers of the tendencies and the sensitive periods. Through movement and the senses images are taken from the experiences of manipulation of objects and from the continuous muscular activity.

The periphery is that part of the child's personality which is accessible to the parent, teacher or caregiver. Adults can observe what is happening at the periphery, but not at the

> « The mind constructs itself through contact with reality, not by absorbing fantasy »

centre. Therefore, Montessori admonishes parents and teachers to 'feed the periphery'. That simply means accepting the adult responsibilities toward the child. We know these well - observe, study, prepare the environment, link the child to it and withdraw.

We know that it is from engagement with material objects that the child will abstract ideas at the centre. It is not, however, possible or necessary for adults to know specifically what is happening at the centre, but it is necessary for the right kind of activity to be happening at the periphery. It is at the periphery that the point of contact is made between the soul of the child and the environment that will nurture his unfolding.

Let us now look squarely at our problem. Of course we have prepared a beautiful environment that contains developmentally appropriate apparatus and is kept in pristine order. There is freedom for choice and exploration. We know our presentations. We observe the child carefully for indications of interest and for manifestations of the tendencies and sensitivities. We understand our role as the dynamic link between the child and the environment. Therefore, we observe, prepare, and then give an enthusiastic and correct presentation to the child only to find that for many children this does not lead to engagement.

We are gentle yet firm. We smile and encourage. Our interest and enthusiasm is there for the child to absorb. We give great points of consciousness. Yet the child does not engage. The child remains inattentive and uninterested and fails to follow-up falling into apathy or disorderly behaviour.

Obviously, something is not right. What is the matter? Is it the Montessori approach to education? Is it a lack in the environment? Is it that we have not understood the natural laws of development and how to serve them? Is it the children, their parents or society itself?

Clearly something is wrong for we are not the only ones who see the lack of engagement in many children today. Educators everywhere are confronting this problem. Take the observations of just two of them. Many of you know the work of Jane Healy and have read her books, 'Endangered Minds' and 'Failure to Connect.' Perhaps you have also read Sue Palmer's book, 'Toxic Childhood.' We Montessorians are not alone with this problem, but it is still incumbent upon us to find solutions and share them.

There are no perfect parents or teachers. There are no perfect homes or classrooms. There are no perfect children. To some extent we are all deviated. There have, therefore, always been some children with obstacles blocking their passage along the path

of normal human development. However, today the number of children with severe deviation is at an alarming level. The child is crying out for help. Society is crying out for us to save the child.

As Montessori said in her time and what we must acknowledge in ours is this. What is missing is the point of contact that leads to engagement. Montessori described this point as 'a psychological bridge, which puts the soul of the individual child in contact with some definite limited piece of external reality.' The point of contact is where the vital activity between periphery and centre begins. It is the beginning point for the child's engagement with the environment that sustains and maintains the unfolding of the human personality.

Going back to the example of the unsettled little boy who finally began to scrub a table, let's see what really happened there. How dare the directress intrude upon the person of the child by putting her hand on top of his? But wait! Let's examine some fundamental guidelines for our service to the child. Never do for the child what he can do for himself. Remember every unnecessary aid is an obstacle to development. Always help the child with that which he cannot do for himself. Observe carefully so as to withdraw as soon as the child begins to act for himself. Intervene and stop destructive acts. Do not intervene in a constructive act.

How do these guidelines relate to the little boy and the table washing? The directress made a decision that she would find a way to engage the child the next day. She said to herself, 'Tomorrow he will work.' Just by making this decision she threw away some obstacles. She threw away the expectation that the boy would just run around disturbing others as he had for almost three weeks. She discarded the idea that nothing works for him. She came to the child with faith in the laws of development and approached him with a positive attitude.

Next, the teacher made an educated choice of activity; she presented washing a table. Never mind

that this child had not yet mastered folding cloths or pouring water from one small pitcher to another. She knew that a perfectly folded cloth or water poured without a splash was not the aim of this effort. And anyway, isn't it easier to pour water from a large spout into a large basin?

The directress set up the material bringing the child with her and giving him directives to do the things she knew he could manage. She worked always to hold the child's attention as she presented so he would have a chance to absorb her actions. Finally, in order to keep the boy focused on the action she placed her hand over his on the scrub brush. In this position the child could see only the tabletop and he could not remove his hand from the brush. The teacher initiated the movement of the brush, which spread soap bubbles over the surface. She made large, firm, circular movements over and over and over. Here she is doing for the child what he could not yet do for himself. Finally the point of contact was made. It came through movement. The little boy began to move the brush of his own volition.

It is obvious why the point of contact is so important. It is the beginning point for engagement with the environment, that deep involvement we see in concentration. It is this deep involvement that Dr. Montessori recognised as work. It is this deep involvement that is a constructive effort for the child. If mental development is to take place there must first be this point of contact between the soul of the child and an external reality and it must always be accompanied by movement.

Montessori has said that the point of contact brings about 'a movement in consciousness that can be described as the creation of something clear and definite.' Two important changes occur. First there is a limitation of movement followed by exactitude and precision. An analogous process occurs mentally. The mind that wandered, turning to this and that, led to restless, uncoordinated, disordered movement. A point of contact will, however, immediately cause a limitation in the mental area. We see this in concentration, which reveals that the child's whole being is focused on that element of the environment that touched his soul.

As establishing a point of contact with reality is so important are there any special guidelines to follow in order to help the child bring his soul into contact with the external world? There are a few. Basically making a point of contact is an individual process. As each child is unique and has his own experiences, what is helpful to one child may not be for another. The Practical Life Exercises are an important avenue for connection. The movements involved in these tasks offer many possibilities for the arrival of a point of contact. Thus our adage of present, present, present. For some children the point of contact may come in the activities of another material area. For example, it might happen with music with the exercise on the line where the child moves his body in response to the changing rhythms. In whatever activity the connecting moment comes, it will always involve definite and precise movement with a clearly appreciated aim.

Once a point of contact is made in the Practical Life Exercises then more and more of them should be given to the child. Then as the work habit becomes stronger additional presentations can be given from the other material areas enabling the child to become fully adapted and functionally independent. In depth study in all the areas of knowledge will follow in the researches of the child in the second plane. In each of the four planes there is an avenue for engagement that will make the individual calm and concentrated. The child whose spirit has been touched becomes an ardent worker, choosing task after task. Isn't this what Maria Montessori meant when she said the child would imbibe the environment?

> When a child chooses and engages with one piece of work after another he is following the natural path for healthy construction

Once the child comes to concentration he is a changed person. He seems to rise to another higher type of personality. He is awakened. He is normalised. He is full of joy. He is at peace within himself. All is right in his world.

Concentration is then the pivotal point in human development. It begins with interest that leads to engagement. Engagement brings knowledge from

which judgement and choice are made. Then comes the intention and decision to act. This results in an act of will that makes manifest the choice that has brought satisfaction to the soul of the child. The satisfying activity is then repeated over and over again. There are two important aspects to this repetition. First, it is spontaneous coming from the love of doing it. Secondly, it is done with an effort to be more exact. This follows the tendency toward perfection.

The great challenge for all of us is to help every child to become engaged and to do so despite the mitigating factors in the lives of today's children. We know that deviations from the normal path of development arise from failures on the part of the child's caregivers to meet the responsibilities of the adult at the level needed by the child. Deviation shows in behaviour because of interference with the normal flow of psychic energy.

Too much screen time, be it the television or the computer or both, is a major and insidiously harmful activity. It supports all three causes of deviation: substitution of the adults will for that of the child, inhibition of movement and abandonment. When screen time dominates the child's life he has little or no time to explore the real world. He is prevented from following his inner drives, which would be his natural will. Watching the screen is a passive occupation and does not require much if any movement. Abandonment to the screen means the child is deprived of the conversations, homely tasks, explorations, presentations, story telling, games and all the other activities that would naturally occur between the child and his primary teachers, his parents. There is even a subliminal message that says to the child, 'You are not important enough to me for me to spend time with you.'

Working with parents in many ways and with more frequency will be needed to build the understanding of the importance of engagement. It means more work for the teacher and for the parents. It must be done with care so as not to offend the parents. But for the sake of the child it must be done. The usual conferences and parent education nights are probably not enough. Study groups that include reading the textbooks can help. A running question and answer column in a weekly note or monthly newsletter is another idea. Guided observations may be needed. Some parents welcome planning sessions to help them with scheduling and with the design of helpful activities, routines and rituals.

Discussions with small groups about some of the materials and activities that could be done by the child may encourage parents to help prepare the child for work. Brainstorming with colleagues is another good source for ideas on how to help the child.

The guidelines we follow in the classroom can also be helpful to parents. Share with them the rules for engagement. Offer synthetic movement. Provide an environment where the child can safely explore reality. Give the child free choice of appropriate activity. Feed the periphery so the centre can unfold. Help the child make a point of contact.

When the obstacles are great it can be very, very hard to remove them. We must accept that some children live behind barriers that we cannot remove. The example I gave of the child who lived in the world of the Hulk illustrates this. However, deviation can be cured before the age of six and we must continue to work hard to help each child find the path toward normalisation.

If, indeed, we are on the cusp of a new era in the history of humankind in which a new biospheric consciousness is required along with a sense of life as communal, then society truly needs the valorised adult personality. Valorisation arrives as the result of life unfolding according to the natural laws for human development. It is the culmination of normalised development in each of the four planes. A valorised personality has not only an empathic sensibility toward all of creation but is also endowed with all the characteristics needed to meet the challenges of our times. As Maria Montessori said, this is a 'complete human being, able to exercise in freedom a self-disciplined will and judgement, unperverted by prejudice and undistorted by fear.'

Let us once again commit ourselves to the task of helping each child become engaged so that he or she can follow the natural path of human development that brings normalisation and culminates in the valorised adult citizen. It is the valorised personality who can bring humanity to the higher plane envisioned by Maria Montessori and so clearly needed today as we enter this new era in the evolution of humankind.

Toys for Children: Less is More

*Have you ever felt that the number of toys you have in your house takes over your life? **Marcy Hogan**, Montessori trained teacher and parent, talks about the Montessori approach to 'toy management'.*

I've never been a big fan of toy boxes. They seem messy, and as if they're designed for toys to get lost and broken in them. It's hard to teach children to be careful of their toys when the way to put them away is toss them into a box with a bunch of other stuff. So when we started thinking about how to set up our son's room and how to store and display his toys, I knew I didn't want a toy box.

Instead, I wanted to set up his room as if it were his own private Montessori classroom. Which means, rather than toys being hidden away in a toy box somewhere, I wanted to find a low shelf to hold and display his toys so he could easily see them and where each toy would have its own specific place. I spent a good bit of time searching for such a shelf, and we eventually settled on what's meant as an entertainment centre from Ikea. It's low to the ground making it easy for him to take them off the shelf and put them back independently. The fact that he can see the toys neatly arranged on the shelf makes them more inviting (they don't get forgotten at the bottom of a box), and the fact that they each have a specific place encourages him to put them back in that spot when he's finished playing

Now, once you have the shelf, what to fill it with? It's difficult, if not impossible, to control what others give you as gifts. But, when we've spent our own money on toys, I've been very careful about what we buy. The most popular children's toys today are inexpensive plastic objects that light up and make all sorts of noise. They are cheap to buy, but often require frequent replacement when they get broken… or are recalled for having been poorly made. Both my husband and I have a strong aversion to toys that make noise, so we've avoided those like the plague (and I would argue it's made us saner parents, not having to listen to the same slice of a song or sentence repeated by a toy over and over!)

> I'd rather buy toys that encourage my child to be creative, to use his imagination, and to decide how to use them

Most of the toys I've bought are made of wood. Wooden toys tend to be better made and last longer [and are, in my opinion, much more pleasing to the eye]. Most of his toys also encourage open-ended play, meaning he gets to decide what to do with them. Many children's toys are designed for a specific purpose, to be played with in one specific way. Some simply require the child to sit there and press a button while the toy does all the work. I'd rather buy toys that encourage my child to be creative, to use his imagination, and to decide how to use them. Wooden blocks, for example, are perfect for this. My favourite places to shop for wooden toys are Oompa.com, Michael Olaf's catalogue, and Ikea (who has a surprisingly lovely collection of wooden toys).

I've often heard parents lament that they would love to buy wooden toys, but they're just too expensive. Who can afford to buy all those beautiful, wooden toys? My answer is that quality matters much more than quantity. Children don't need a mass of toys.

That's part of the beauty of using a shelf over a toy box. A shelf holds only so much space, and so it naturally limits the number of toys you can have out at any one time (I keep his other toys in plastic bins stashed in other parts of the house, and try to rotate the toys on the shelf about every 1-2 weeks). Have you ever been at a store and needed to buy, say, face lotion or contact solution, and you stare at the wall full of options and freeze, unable to make a decision? I really believe children experience the same thing with toys. Having options is good, having too many options can be debilitating. If they have a multitude of toys in front of them, they don't really know what to do. They might start playing with one, then get distracted by another, and will only play superficially with a series of toys without ever really sitting down with one and getting lost in play with it. This means they don't get that opportunity to develop focus and concentration by playing deeply with one toy for an extended period of time.

I know I've noticed a difference in the quality of play in my toddler when I keep the number of available toys low versus the days when I try to buy myself with them for much longer periods of time. When I bring out a boxful of toys, he'll get excited about all those toys to play with… but then quickly tires of them and looks for something else to do.

Also don't forget that you don't have to spend lots of money for good quality, simple toys. Bowls, wooden spoons, and measuring cups from your kitchen can be incredibly entertaining for an older infant or toddler. Or, go outside and find some sticks, dirt, and rocks. It can be surprisingly simple and cheap to find fascinating 'toys' for little hands and minds to explore.

By the way, the added benefit of limiting the number of toys you have out? Much more manageable housekeeping. Picking up 10 toys off the floor is much easier for you and your child to clean up after than picking up 20 or more! So bottom line, less is more – both for you and your child!

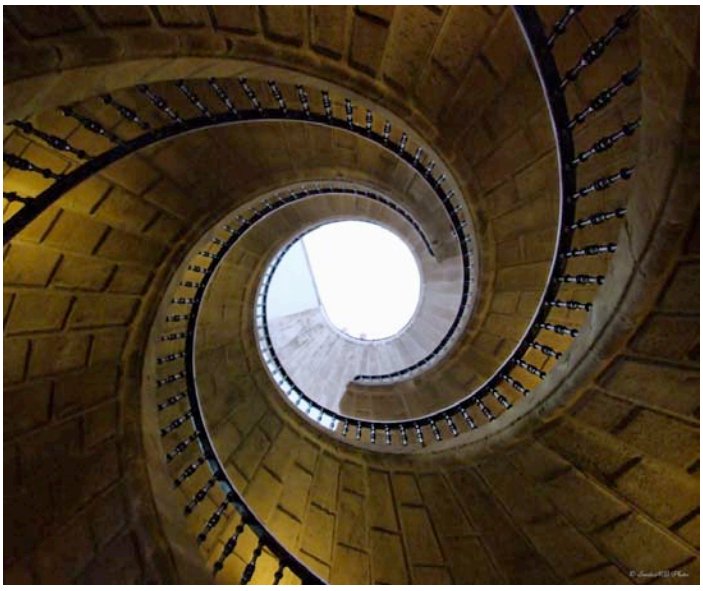
Marcy Hogan writes about parenting and life in general on her blog, *Life is Good.* This article first appeared on Mariamontessori.com

Supporting the Mathematical Mind

The Montessori approach gives plenty of support to the development of a mind that is by definition mathematical in nature. But for the child's mind to flourish the Montessori teacher also needs to focus on the detail. ***Louise Livingston****, AMI Trainer, helps us to examine the detail of our practice.*

Montessori tells us that all human beings have a mathematical mind but how do we know this? Mathematics permeates everything in the natural world and since we are part of nature ourselves it stands to reason that there should be something mathematical running through us too. We see mathematical patterns in the petals of a flower and the stripes of a zebra. But that is not what we think of as mathematics – when we think of mathematics we think of all those terrible numbers and symbols that were the nightmare of our school days.

Man has attempted to describe all the laws of nature using mathematics and for this purpose he has agreed a common code to represent them symbolically– a system of numerals and symbols to represent the quantities involved and the relationship between them. This is the mathematical code. That is all it is really – a code that we have agreed to represent our understanding of quantity, pattern and spatial relationships – a language where the symbols are the alphabet and the equations are the words, phrases and sentences.



This symbolic representation of the laws of nature is mathematics. Since this symbolic language was created by the mind of man, it stands to reason then that this mind must operate along mathematical lines itself and for this reason everybody should be able to do mathematics.

Mathematics has allowed man to think about the laws of nature and to apply these to create the world that we see around us today. Furthermore our ability to calculate, judge and be precise is in everything we do as human beings. To walk up the stairs we have to judge how far to lift one leg and when to move the other one in order to progress rather than fall over. Even just holding a conversation requires us to listen and wait, judge when to keep quiet and use precise words to convey meaning. Even expressions of the spirit such as art, music, and dance are all underpinned by these mathematical laws.

As we know the child is creating himself in the first six years of life. If we are to support this process then we must support the development of a mind which is mathematical by nature.

As Montessori says:

'Great creations come from the mathematical mind, so we must always consider all that is mathematical as a means of mental development. It is certain that mathematics organises the abstract path of the mind, so we must offer it at an early age, in a clear and very accessible manner, as a stimulus to the child whose mind is yet to be organised.'

This is the real reason for offering mathematics to the children at this age. It is not just so they can do sums – it is for 'mental development'; to give help to the building of this type of mind, remembering always that we are talking about 'the child whose mind has yet to be organised,' the child who is constructing himself during this time. The

child who has an absorbent mind with a huge capacity to take in whatever we offer so long as it is offered through the senses and through activity. As neuroscience now confirms it is activity that builds the structure of the mind. And as Montessori says 'Mathematics is easy when its roots are planted in the Absorbent Mind.'

But experience tells us that mathematics is not easy for everyone and perhaps for many of us this is because we were not taught in a way that we found accessible. We were offered abstract ideas and expected to memorise rules. Furthermore, it was not offered to us at the time when we learned with ease. Usually these things were offered to us at a time when only hard mental effort would get us through it.

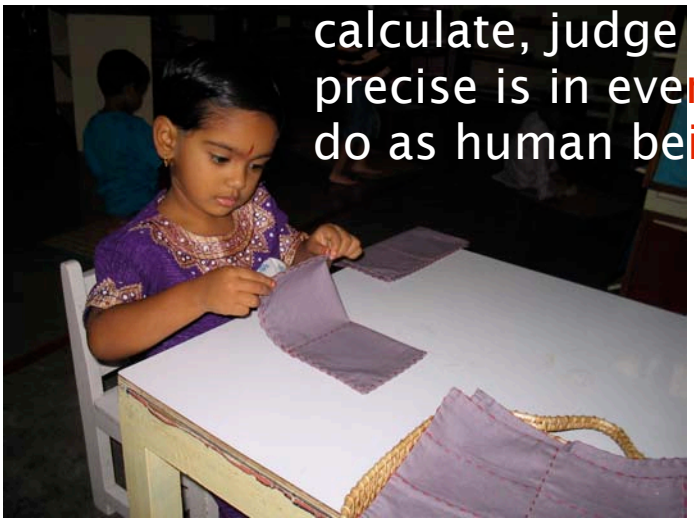
Many of us were never taught properly how to crack the mathematical code. So if we are taught the letter A but are never told the sound that it makes, we will not be able to read or write, if we are taught the numeral 9 but we don't know what quantity it represents, then we are never going to be able to do mathematics.

What kind of mind is a mathematical one?

One that can abstract the essential from what it finds in the world around him and use what it finds as a basis for creation
One that can calculate, make judgements and draw conclusions
One that strives for precision and perfection
One that can apply logic and reasoning

Where do we start then to support the development of this kind of mind? As Montessorians where do we always start? With Practical Life!

We offer activities that the children can use their hands for – to pour, to polish, to do up buttons and to scrub tables. They help the children to develop their physical skills of course but they also help them to make judgements, to calculate, to assess and to come to conclusions. Children are striving to put things in order and to do things more precisely and more perfectly. As Montessori says,



«Our ability to calculate, judge and be precise is in everything we do as human beings»

'In our tiny children the evidence of a mathematical bent shows itself in many striking and spontaneous ways. In fact, if we showed them exactly how to do something, this precision itself seemed to hold their interest. To have a real purpose to which the action was directed, this was the first condition, but the exact way of doing it acted like a support which rendered the child stable in his efforts, and therefore brought him to make progress in his development. Order and precision, we found, were the keys to spontaneous work in the school.'

So we need to give our attention to these two aspects – order and precision – since these attract the children, which is a pretty good indication to us that they represent a developmental need.

When the materials are prepared precisely the child is guided to act precisely in order to be successful with what he is doing and this means that his mind will develop the ability to apply precision. The level of beans in the pouring must be just enough so that when the child pours and wants to fill another jug to the top there is exactly the right amount. Cloths and towels must be folded precisely – everything lined up neatly – so the child absorbs precision and seeks to restore it again after use. Even things like the buckle frame or the button frame must call for precision – if the buckle is old and stretched and floppy the child does not have to make precise movements to get the pin through the hole or the button through the buttonhole. He can do it in a sloppy manner and it will still work. But if it is precise he will have to

fine-tune his movements to be successful and this fine-tuning also fine-tunes his mind.

Of equal importance is that we must be certain to show the child what to do in a very precise way. When we break down our movements so that they are economic, clear and concise he will absorb this precision and this will be a further guide to his mind.

When we pour exactly the right amount of polish to cover the mirror – not too little so we don't quite cover all the mirror and not too much so that there is some left over – the child is encouraged to also make these fine adjustments in order to be successful and as we know, the child becomes what he does.

Furthermore, we must give him pointers for perfection. We must show him exactly where to put his fingers to overcome the resistance that a zip might offer. This encourages him to focus his hands and his mind precisely.

Once the child has mastered the idea of matching and can find two things that are the same, we can ask him to look for what is nearly the same. When the child does this kind of grading activity his mind is developing the capacity to make finer and finer distinctions. And is this helpful for mathematics?

Developing an understanding of mathematical concepts

The sensorial materials also act more directly to help the child understand mathematical terms. We know that we help the child to develop an understanding of dimension using the cylinder blocks, pink tower, brown stairs and red rods. He comes to an understanding of difference in length by first experiencing difference in three dimensions, then two and then one. Montessori did this by taking an abstract quality like size and applying it to something concrete because the child can only learn through manipulating something concrete at this age. She made everything else the same – colour and shape - so that the child's attention is focused only on the difference in size. When the child builds the pink tower he internalises the differences in the size. This does not happen straight away, of course, but with time as he practises repeatedly with the material. From something concrete he takes an abstract idea, that of size, and creates an understanding within himself.

«Children are striving to put things in order and to do things more precisely and more perfectly»

But building the Pink Tower once is not enough to make this happen. It's a start, of course, but if we want the child to make a full abstraction then we need to make sure that we offer other exercises and challenges. Can you build it in this corner of the mat? In each corner of the mat? Can you build it with two sides flat? Can you run the smallest cube around the ledge? How else can you build it? So that he does not just build it once and then move on to the Brown Stairs and then the Red Rods - because this is what it says in our album. When we do this we might find that the child can build the Pink Tower and can probably also build the Brown Stairs, but for some reason is really struggling when he gets to the Red Rods. How often do we see a child really struggling with the Red Rods? It is because he has not had enough experience with the Pink Tower.

He needs repetition because with every repetition comes a further understanding. We must be sure that we guide the child's mind from the concrete all the way to abstraction of the idea of size. Every time he builds it he lays down a trace in his subconscious. A connection is made in his mind. A neural pathway is connected.

But we also want him to be able to think about this experience. So we can give him some games where we ask him to think about his experience. As he trips from one mat to another thinking about what size he needs to get next, he is thinking about a concept and he becomes more conscious of what he has learnt. He is making that trace that was in his subconscious rise into his conscious mind.

Then we can give a name to this idea and this name helps to crystallise the idea for him because a name helps us to think about something, to talk about it with others and increase our understanding of it. It is essential that we help the child to name his experience. We must give him larger, larger, largest or small, smaller, smallest because without a name it remains Just another trace laid in his mind, another neural pathway hidden in his subconscious. But when we

> The child needs to be helped to reach a level of perfection through prolonged and repetitive activity

But when we play 'games' that allow him to use the language such as 'Can you bring one that is larger than this?' or 'One that is just larger than this?', then he can talk about this experience with someone else and it becomes an idea represented by a word, a mathematical concept, large or small, represented symbolically.

When the child has accurate, precise words to describe his understanding he has access to a part of the mathematical code we have agreed upon to describe our world. In this way the sensorial materials give the child ways to express mathematical concepts – not just large, small, thick, thin, long, short, but light, heavy and triangle, square and trapezium to name but a few. Not only does he have a concrete experience of mathematical terms but he knows how to describe them. But if he had built the Pink Tower once and moved on to the Brown Stairs without a backward glance this might never have happened.

Applying what the Mathematical mind has gained through this activity

Not all of the materials isolate a quality in this way. Some of them simply offer opportunities for the child to explore, using what he has learned to explore mathematical ideas. The Knobless Cylinders, the Constructive Triangles, the Binomial Cube all do this. Because these materials rely on the child having already acquired some understanding, the timing of our presentation to the child is crucial.

Knobless Cylinders

With the Cylinder Blocks the child gets the opportunity to compare four different mathematical series. At first he looks at them individually and maybe that's where he stops unless we challenge him to take two blocks together, then three and then all four so that he starts to experience the difference between them. But just because he can sort out all four blocks when mixed up, this does not mean that he is ready to do the Knobless Cylinders. Montessori took the knobs off the cylinders so that the child could line the four series up and place them on top of each other and underneath and in front and behind, so that the child could make comparisons and absorb ideas about mathematical series. But until he has the capacity to look at them, actually see the differences by comparing them and to draw conclusions then he cannot really explore them in any meaningful way and they just remain as toys, building blocks, trains, towers to be built up and sabotaged by a passing UFO! As we have all observed when his capacity to discriminate is not yet developed, he cannot really explore them. He will develop the skills to compare and differentiate difference every time he pairs and he looks for what is the same and what is different and every time he grades and looks for something that is nearly the same but not quite the same. Doing these kinds of activity he develops the capacity to explore scientifically and mathematically.

Then when we offer him the Knobless Cylinders, after all of this experience, he can apply this

scientific approach to his exploration. What he experiences is seen through different eyes. Instead of building trains and towers to knock down the fundamentals of calculus are being absorbed into his soul.

> When the child has accurate, precise words to describe his understanding he has access to a part of the mathematical code we have agreed upon to describe our world

Binomial Cube and the Trinomial Cube

It is the same with the Binomial Cube and the Trinomial Cube. We could give the Binomial Cube to a two-year-old and he will work it out. It is not that hard. It is a puzzle and he will solve it through trial and error. But when we wait and we offer it to the child when he is a little older, when he has had the opportunity to explore the difference between a cube and a prism with the Geometric Solids, and has explored changes in size in two dimensions and one dimension with the Red Rods, and has already seen the patterns that he will be exploring in the Binomial and Trinomial when he built the Decanomial Square, then it becomes something different. He is exposed to the ideas of the Binomial Theorem. He experiences the difference between a x b squared and b x a squared. It is no longer just a puzzle for a two-year-old but food for the mathematical mind to work on.

Constructive Triangles

What about the constructive triangles then? Don't the children love those? They love to put them together and make new shapes and patterns. But again, a two-year-old could do this. You can buy shapes in the Early Learning Centre and they can do this. But how different their experience when they have had enough experience with the Geometry Cabinet, feeling the shapes, matching the cards, using the language of trapezium, decagon, parallelogram and so on and playing the games. They have abstracted the idea that a shape is a space bounded by lines and that if there are three lines and they are all different lengths, when I put them together I get a four-sided shape which we call a rectangle. When two of those sides are different in length we get a four-sided figure that we call a square and if all the sides are the same we get a rhombus. When the child sees a shape that he knows, and not only does he know it but he knows its name, it is like being in the busy streets of Bombay and bumping into his best friend! But if he doesn't know these shapes and doesn't their names then they just pass him by in the street. He sees them but he doesn't remember afterwards that he saw them. His exploration is not intelligent. It does not feed his mathematical mind - it is just playing with shapes.

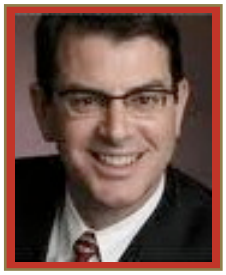
But when we offer the full scope of what the Sensorial Materials have to offer the child we can see that he will learn to compare and contrast, make judgements and draw conclusions. He will learn to apply reason and logic to everything that he does. He will abstract essential mathematical ideas and be able to use mathematical language accurately. All of these things will help him to be able to explore further mathematical concepts using his mathematical mind.

Because we have supported the mathematical mind during the time of its construction we can expect great things from these children. As Montessori says,

'If we study the works of all who have left their marks on the world in the form of inventions useful to mankind, we see that the starting point was always something orderly and exact in their minds and this was what allowed them to create something new'

This article is adapted from a talk given at the Montessori Education UK Conference in May 2010

Neuropsychology and Montessori



*The neuropsychologist **Steve Hughes** explains why those who know about brain development believe that a Montessori environment is the optimum 'educational' environment for children*

Montessori education is a brain-based, developmental method that allows children to make creative choices in discovering people, places and knowledge of the world. It is hands-on learning, self-expression, and collaborative play in a beautifully crafted environment of respect, peace, and joy. It is also about brain development. A skilful Montessori teacher knows what stage a child is in their brain development and they are meeting it, and they are feeding it. The Montessori method is like education designed by a paediatric developmental neuropsychologist.

Montessori education is the original and, I think, the best brain-based model of education. The body is rather interestingly mapped along the surface of the brain. It is not mapped on the brain in any way that matches the size of the area. It is not a one-to-one mapping. If you were to build a human based on what the brain thinks a human looks like the most striking feature would be the unusually large hands.

Why do young children, who are still developing the ability to understand language, spend so much time sitting and listening to teachers at a conventional school? Wouldn't it be nice to design an educational model around hands-on activity, physical manipulation, and engagement in the world? Maria Montessori did just that.

There is a model of the way the brain is organised and how it works which I refer to as the nuggets and networks system. Areas of the brain do not function in isolation, they communicate with other areas through networks of active fibres. Brains need healthy nuggets and healthy networks in order to function.

> Montessori education is the original and the best brain-based model of education

Nuggets can be defined as small, circumscribed areas of the brain that perform a specialised function such as reading. Reading is a cognitive function that requires the coordinated use of more than one nugget. Reading does not happen in one spot in the brain; it's the coordination of multiple spots that cover things like letter and word recognition, phonological processing, and language comprehension. Somehow, Maria Montessori knew about these nuggets. The Montessori reading curriculum is astonishingly dead-on in helping developing brains condense the nuggets that perform these certain functions.

In the brain of a child with a learning disability, there is a nugget that is not formed. That nugget is necessary for a critical component of reading. If we can identify that a child has a nugget that is not firing correctly, or not at all, we can help that nugget form. One of the ways you do that is through a series of very circumscribed, specific, and repetitive tasks that are about training that little undeveloped nugget. You can actually do some

significant remediation using that method.

Networks are the fibres underlying the surface of your brain, or your cortex. When you are confronted with a novel task, your brain needs help. Your brain then calls on all quarters to solve the problem. A healthy and well-developed network system helps bring all hands, or all neurones, on deck. There is a lot of general processing happening everywhere in a novel problem solving brain.

In a Montessori classroom, a child will learn how to grip an object using the Bailey's two-point pencil grasp through doing cylinder work; the little handles attached to the cylinders require that sort of handling. When the child then moves on to writing, they know how to hold a pencil as a result of all the time they spent handling the cylinders. This is an example of how the networks in your brain function. The novel task of holding a pencil is supported by previous activities.

Repetition builds better brains

There are some things we know of that can help brains develop healthy and strong nuggets and networks. Repetition helps build better brains. Repetition is a big part of the Montessori environment.

Take, for example, the pink tower. The child's motor system is developing so that he or she can hold the top pieces of the tower high and still enough to place them on top of each other. It feels good to develop this mastery. We can also build better brains by providing our children with settings in which they feel secure. A child can sit in a quiet, beautiful spot in the classroom and look at a book in peace. Or they can take care of plants. They have the freedom to check to see if the plants need watering and the knowledge of how to care for another living thing.

Hands-on work can also enhance learning. There is research that directly compares the effects of observational versus hands-on learning. You will not be surprised to hear that hands-on matters. In a Montessori classroom, children learn that tasks have a beginning part, a doing part, and a completion part. All of these practices of life activities are supporting the development of networks that will be utilised in practical daily tasks.

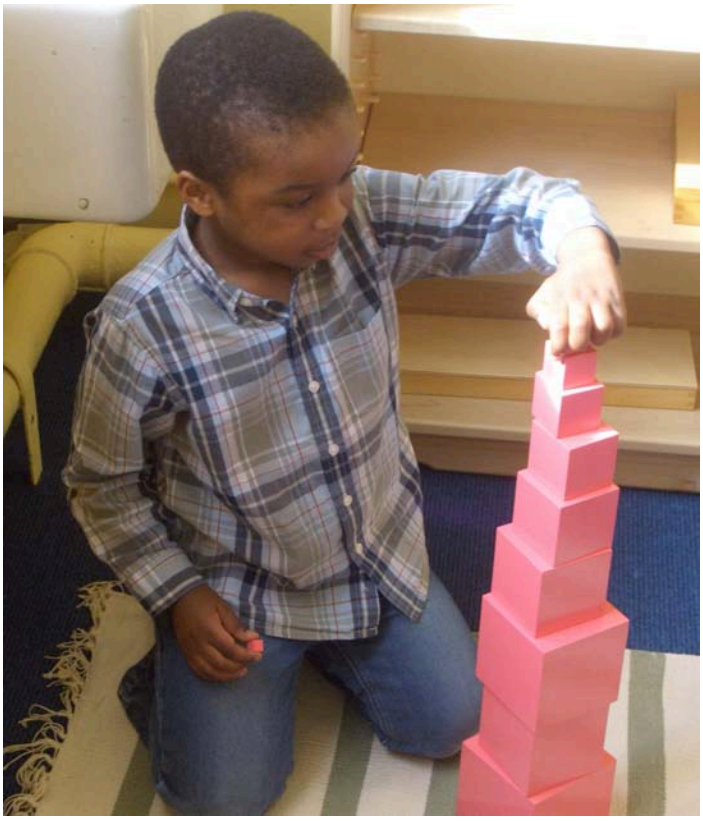
We know we can also build better brains through multi-sensory activities or through sensory specific activities. Maria Montessori observed that children are drawn to balancing on railings or tightrope walking on lines. She noticed that children are drawn to these sorts of things, so she understood there must be a sort of developmental need for them.

Maria Montessori wrote late in her career about characteristics that emerged everywhere in the world in children that come out of these Montessori environments. They had a love of order, of work, of silence, and of being alone. They had profound concentration abilities. They demonstrated appropriate obedience not obsequiousness. They showed independence and initiative, and they had spontaneous self-discipline. They were well-attached to reality, and they were joyful.

I think we are starting to realise, at national and international organisational levels that we need to analyse and harness the forces that control what happens in schools, and we need to work to change society for the benefit of children.

In fall 2006, Angeline Lillard published a study in Science, one of the most prestigious journals in the world, which examined academic, social, and intellectual outcomes of children who were educated in a Montessori environment. She used a student sample from Milwaukee, where there is fantastic public Montessori involvement. Many people want to send their children to Milwaukee's Craig Montessori School. You have to enter a lottery to be accepted. Lillard was able to compare the children who won the lottery and went to the Montessori school with the children who applied but did not win the lottery, and ended up at other schools. This provided Lillard with a largely urban, lower-income, diverse study sample. It also gave her random assignment participants.

In her study, Lillard found that Montessori children demonstrated significantly stronger social cognition skills. They performed better in academics and were better able to put themselves into the shoes of somebody else in the understanding of what had gone on in a situation.



The general summary from Lillard's work is that in a real-world, public, inner-city Montessori school with an excellent implementation of the Montessori model, there were differences favouring the Montessori kids in executive functioning, decoding and early maths, understanding of the mind, and appeals to social justice and social behaviour by the end of kindergarten. Those advantages were present early on, and remained at grade 6.

People do not doubt that the Montessori method works for children of privilege. They are delighted to hear it works in inner-city public school systems [state school in the UK], because most children go to conventional public school systems. There is no reason that schools in our culture have to be the way they are. It is about industrialisation. It is about tradition. It is about inertia. Nobody who is a developmental psychologist, nobody who is a neuropsychologist would design a school today that would look like a conventional school does today. It is just habit.

At this point, in the history of the world, in the history of our civilisation, what happens next will depend on how the earth and it inhabitants are regarded by those who stand to inherit it. I believe that if our children and grandchildren are to see the 22nd century, those who are running things now need the 21st century to value a civilisation that holds peace and kindness, and justice and respect for the needs and welfare of others as core values. These values lay at the heart of Montessori education and I believe these values will support the value of our planet and our species.

Like Father, Like Son – a Key to your Child's Independence

The Aid to Life Initiative aims to put all parents in touch with principles of child development by presenting the Montessori ideas in an easy-to-follow way that parents will find easy to implement. As part of the launch of the initiative in the UK this article was published in Jump Magazine, and has been sent out to 1.2 million new parents

Goodbye, and please try to be home before the children are in bed. And don't forget you need to drop by the supermarket on your way home.' I remember my five-year-old daughter saying this to her little brother as he trundled off down the pathway on his tricycle, clearly on his way to 'work' with his lunchbox masquerading as a briefcase.

At the same time, I also heard the familiar tone of my own voice and had the realisation that everything my little girl did was modelled on what I did. Not only her actions, but also the words she used, the tone she adopted, the way she moved, her mannerisms, even the way she related to people.

This is something that we know instinctively. 'Like father, like son', we might say when our son picks up some endearing little habit from his dad. But have we ever stopped to wonder how it comes about? Scientific research carried out on the brain tells us that infants' minds work very differently to ours; we learn by effort, they simply watch, listen and do; we learn consciously, they learn by interacting with the life going on around them; and whereas we have experiences, young children become what they experience. Furthermore, we are told that this development is enhanced by special 'windows of opportunity', which last for a limited time and make learning spontaneous and effortless only at this time.

When the 'windows' close, the opportunity for effortless learning also closes. Little wonder, then, that your child is so interested in doing what you do. When they want to dress and feed themselves, prepare food and help with the washing up, it is because doing these things is good for their development and they instinctively know this.

Neuroscience has helped to explain that when children are involved in activity of this kind, their brains are rapidly making connections and enhancing their intelligence. Knowing that children have a unique capacity to use imitation as a means of development has implications for us all. If children have the wherewithal to develop themselves, our role as parents becomes one of helping them in this, rather than assuming the more traditional role of just doing things for them. We need to become their developmental guides, and it really is as easy as one, two, three...

One – make small changes to your home that will help your child to do things for himself. Two - show your child how to do the things that you do simply by slowing down your movements so he can really see how you are doing it. Three – allow a little more time at the start to give your child the time he needs to practise getting good at them.

1 Create a home that helps your child become more independent

- Make a few low shelves in the bedroom and living room and give toys their own place. Encourage your child to put them back on the shelf when they are finished playing. Even babies who can't walk can reach their things

- and older children enjoy seeing what there is to play with. If there are too many toys, change them around every few weeks.

- Make it possible for your child to do things independently with access to things that will help, for example, child-sized tools that really work, a small broom that sweeps and a dustpan and brush to fit small hands; low hooks for coats and towels, a small stool for access to the table or kitchen worktop. Put some clothes you're happy for them to wear in baskets in the bottom of the wardrobe, and watch how quickly they start to want to dress themselves.

« help your child gain confidence by allowing her to do the things she can do by herself »

- Whatever you like doing, try to find a way for your children to do it too.

2 Show them how

- Your child learns how to do things by watching everything you do – try to demonstrate rather than explain.

- Break the actions down into simple steps. With buttons, for example, undoing one to begin with is easier than doing it up. Start by showing how you hold the button on one side, make the hole a little larger by pulling the material to the side and 'tip' the edge of the button through the hole and watch it disappear. Once this is mastered over several days, demonstrate how to do it up by holding the side of the button, turning the material until the underside of hole is revealed, poke the edge of the button through and watch as it appears on the other side. Change hands and give the button a pull, slipping the material over the edge of the button.

- When helping your child to do things around the house, talk about what is needed to achieve the task and gather the items before beginning. Planning ahead and organising what is needed will help your child become more successful at what they choose to do.

- Your child gets good at doing things by doing them independently, little by little – help them to gain confidence doing the bit they can do, and showing them what they're ready to learn. There are many ways in which you can collaborate together – dressing, washing, cleaning, cooking, tidying, eating and having fun.

3 Make time

- Your child will take longer to do things than you do and will often become interested in repeating the same action rather than finishing the job. Helping load the washing machine often results in the same sock being put in and then taken out of the machine many times. Just load the rest a little faster yourself.

- When you have time, start early enough so there is not a rush, children enjoy doing things and have no sense of time constraints.

Try not to do anything that your child can already do alone and encourage them to ask for help when needed. With repetition they begin to be able to do things, and you can judge when the challenge is being enjoyed and when it is all too much. One day a child may do almost everything, and then the next they may seem to have forgotten how to put on a coat or cut up a banana. Don't worry, just keep demonstrating and give your child time to practise.

In time, your child will be able to get dressed, pour a drink, lay the table, wash, and help prepare lunch; just a few daily tasks that we may tire of, but small children get a huge kick out of doing. Doing things for themselves means learning to think for themselves, which builds a feeling of self-confidence they'll take with them through life.

So the next time you hear a voice say, 'Don't worry, I'll do it for you', it won't be your other half offering you help at the end of an exhausting day, but your five-year-old following a natural developmental path.

Find out more about other principles of child development at AidtoLife.org. The article can be found at www. jump-magazine.co.uk

Yesterday's Discoveries Today's Science

How does current science view the Montessori approach to Mathematics?

The 'Kids Don't Count' documentary, recently shown on the Channel 4 programme Dispatches, reveals that in 2009 more than one in five children left primary school having failed to grasp the basic numeracy skills required by the National Curriculum. Research also shows that failing to grasp the fundamentals of maths at primary school leaves only a one-in-ten chance of catching up by the age of 16. It is compelling but disturbing viewing, watching a 10-year-old struggle at the whiteboard to find the answer that should come easily to an 8-year-old. The question is ½ + ¼: one child decides that ½ + ¼ is equal to 3 ¼, another that the same sum is equal to 1, another that it is 2 ½, another, even after drawing the problem accurately, names it as 3 thirds, and others simply shake their heads and say they do not know. They echo the sentiment: 'I don't like maths'.[1]

But this frustration with maths seems absent in the Montessori environment.

One Montessori Children's House recounts a visit from a local headmistress and her colleague. The visitors sat and watched the children come in, greet the Montessori directress, and each choose their work. They watched as a child moved two tables together, tucked in the chairs, and took out the Addition Strip Board, laying out each part of the material painstakingly precisely before beginning work on the addition sums. They watched as a little girl put on her slippers and went straight to the Multiplication Board without even saying hello, put her head down so that her hair fell all about her face as she does when she gets really into something, and started skip counting with the beads. As they left, they asked their guide, 'How do you get them to do that?' 'How do you get them to come in and choose to do multiplication?'

Perhaps it was so striking, because teachers do often experience that children try to avoid maths - that they often need to offer incentives such as stickers or dinosaurs, witches or pumpkins for the child to colour in as a reward. One American school even used pizza vouchers as a reward for mathematical achievement!

This is something that is reflected in OFSTED's expectations for children from 0-6. In the Foundation Stage Profile tick chart for mathematical development, we find their expectations peak at 'uses numbers up to 20'.[2] Montessorians are always tempted to put in extra boxes for 'Able to count to 1000'; 'Able to skip count', 'Able to add, subtract, multiply and divide with 4 digit numbers', 'Has an understanding of the decimal system and place value up to the thousands category', 'Able to add and subtract fractions of the same denominator', or 'Able to interpret and solve word problems'.

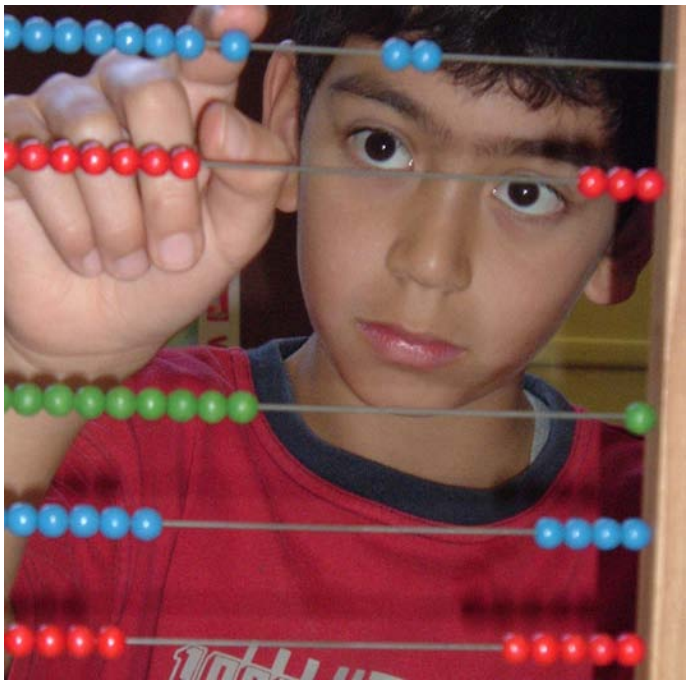
But most tellingly, there is no tick for 'Absolutely, completely, head-over-heels in love with mathematics' or 'Chooses independently to take on a challenge in maths', or 'Chooses to continue to solve sum after sum even though all her friends have gone to lunch and there is no one left in the Children's House'. Perhaps to the powers that be, these ticks are either impossible, or unimportant. To Montessorians, this fascination is the most important character attribute to protect.

Mathematician Stanislas Dahaene reiterates this viewpoint: 'I am convinced that children with equal initial abilities may become excellent or hopeless at mathematics depending on their love or hatred of the subject. Passion breeds talent – and parents and teachers therefore have a considerable responsibility in developing their children's positive or negative attitudes towards mathematics.' [3]

He goes on to say that 'In the final analysis, all mathematical knowledge is incorporated into the biological tissues of the brain. Every single mathematics course that our children take is made possible by the modifications of millions of their synapses, implying . . . the formation of billions of molecules of neurotransmitters and receptors with modulation by chemical signals reflecting the child's level of attention and emotional involvement in the topic.'

The key is to *protect the passion*, because so much of the ability of the mind to work effectively is dependent on it. In the end, what has to be most important is development of the love for maths. And we Montessorians say 'protect' because it is not about us building it, it is about us preventing it from being frustrated, discouraged or fed up by the incredibly boring and confusing ways humans have come up with in modern times to teach maths.

Montessori believed that a mathematical mind is not only present in man; it is present from birth. To do maths is to be human, and there is evidence of this throughout human history.



Tobias Dantzig, in his book Number, the Language of Science, said 'Man, even in the lower stage of development, possesses a faculty which, for want of a better name, I shall call *Number Sense.* All people possess, even within their first year of life, a well-developed intuition about numbers. Experiments demonstrate that human babies, far from being helpless, already know right from birth some fragments of arithmetic comparable to the animal knowledge of number. Elementary additions and subtractions are already available to six-month old babies!' [4]

Where do we go so wrong then? How do we get from this infant, whose mind is working already in such a mathematical way, to the older child in maths class, whose mind seems to have lost its instinct for maths? Montessori says that the key to tapping into this inborn love for maths is understanding the child's mind at different stages of development.

Henk Barendregt, a prominent Dutch mathematical logician, chair of Foundations of Mathematics and Computer Science at Nijmegen University in the Netherlands, professor at Carnegie Mellon, recipient of Spinoza award, and Montessori student from the age of 4 to 17, says that the ability to do maths involves much more than knowledge of numbers and form. Indeed, for him the journey began with what he calls his first encounter with a materialised abstraction: learning how to zip up his cardigan with the Montessori material, the zipper dressing frame. He noted that his experience here of receiving feedback from the activity and not an external source, from the control of error Montessori designed and injected into her materials, was a vital part of the development of his mathematical mind: 'As soon as you have experienced that sensation, you are capable of doing things whose outcome is not so black or white. That first experience of truth will give you a wonderful sense of stability; it leads to self-confidence and for these things I am still grateful.' [5]

It is striking that he also sees how his first experiences of independence, as from the zipper frame, were central to his development as a mathematician. Before, his mother had to help him get dressed. 'I can still see myself standing there, little arms outstretched, waiting. Now I was capable of doing it myself, and it dawned upon me that a great school will make me independent.'

But perhaps most significant is the joy that he recalls accompanied each experience with the materials: 'She [Montessori] understood the essence of mathematics and was capable of expressing that through the materials. Some of the Montessori materials were pure bliss, such as the cylinder blocks, and the bead material representing decimal numbers.'

He goes on to reflect on the power of the Montessori maths materials in helping the child achieve a deep, clear, and sound understanding of mathematical concepts – a power that comes from enabling each child to manipulate materials with their hands, absorbing through their senses patterns and relationships, and thus begin from a concrete experience of each abstract mathematical concept. 'At home my father taught me the algorithm of adding numbers. I could do it, but did not understand. The golden material showed me in an instant the meaning of the algorithm, and that it was correct.'

The joy that erupts from the children's work with the maths materials comes from how they respond so perfectly to the mind at this particular stage of development – this child is a sensorial learner. Adults' preconceived notions of what is appropriate for preschool maths, tends to be that which is simple – 1+1, 5-2, etc. Children at this age however, are excited and stimulated by the prospect of doing addition with 4 digit numbers, as they do with the Decimal Beads. In fact, they will often choose to work with the largest numbers possible. They are not only excited by these maths problems, they can understand them, because the concrete material they work with makes the information accessible to this sensorial explorer.

Montessori noted that one of the chief reasons why the learning of mathematics in the first years of traditional school education is so difficult is because 'information is being transmitted by word of mouth, and not through an apparatus that permits individual activity.' [6]

She found that this resulted in the limiting of the mathematical concepts we offer to the young child, and that ironically, this is what often results in a dislike of maths: 'Children are being given things that are too simple for them and consequently, rather than their interest being aroused, the children are being bored and this causes 'barriers' to arise in their minds.' [7] Montessori saw that the mathematical minds present in very young children were not only hungry for more, but capable of understanding so much, as long as it is presented to them in a manner that matches the manner in which their minds work at this stage of development – through sensorial, concrete work that they can repeat again and again, each time through their individual activity, achieving a stronger and deeper understanding.

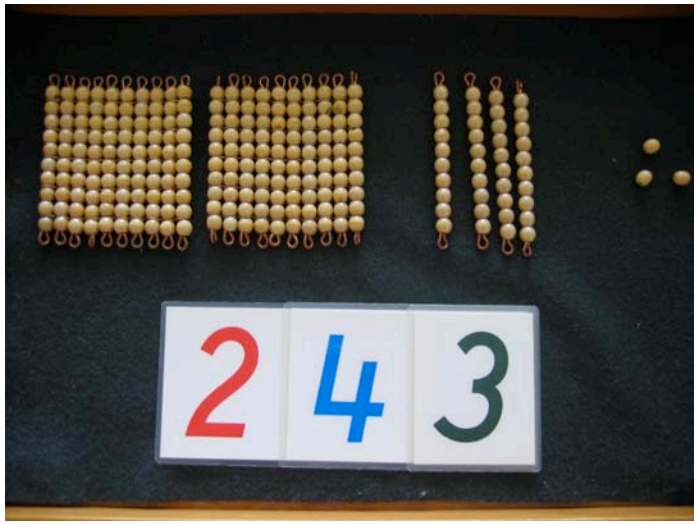
The golden beads that Montessori had developed so that children could do all the different operations with 4 digit numbers were material she had originally assigned to the older children of about 10. Her observations found, however, that these older children were no longer interested, and had gone beyond this material. Offering it to the pre-school children, to an age far younger than traditional education would deem capable of understanding such large numbers, she found they fell on this complex work with delight and pleasure.

Montessori noted that the temptation to skip ahead to the abstract before the concrete foundation is laid not only limits the depth and complexity of what we offer our children, but results in children whose heads are filled with simple mathematical facts, but empty of mathematical understanding, passion or insight.

'School life must not be centred around a fixed programme: a mechanical device by which the young mind is presented with certain information to be memorized. For by so doing, the marvellous impulses and the great powers that are surging forth in the young, like an irresistible flow of sap, are not only being completely disregarded, but are often being thwarted.' [7]

The documentary Kids Don't Count highlights exactly this as a problem. It is remarkable that the maths remedial programme that was so effective at improving the mathematical achievement and understanding of students at Barton Hill Primary, a school in the bottom 4% of maths results in the country, was one that went back to the very basics of counting, and used material that made abstract concepts concrete – in this case, with plastic cups!

As Professor Julia Higgins from the Advisory Committee on Mathematics Education says, 'Mathematics is one of those subjects that builds piece by piece on what you already know. If you've



got a hole anywhere, you actually have enormous difficulty grasping the next stage. You can imagine mathematics as a ladder. People just fall off it at different stages, and the next rungs on the ladder, well, they're not accessible to you.' [1]

It is an observation Montessori echoed: 'The seeds of mathematics must hence be very, very carefully sown. We must not confuse the trunk of the tree with the branches. We must certainly not expect good branches to grow on a dead tree. Many people reduce mathematics to certain feats of memory. If we make children learn that three and three make six or two times four make eight, we are constructing a tree, by nailing small dead pieces of wood to a larger piece of dead wood so that it resembles the trunk of a tree with branches attached. In doing so, we have only created an illusion. It is no tree . . . it will bear no fruit. . . Instead if we plant the seed carefully, we can watch the little plant take firm root, sprout leaves, and grow strong branches with pleasure.' [8]

Lori Woellhaf, AMI Diploma Holder

[1] February 10, 2010. Kids Don't Count, Dispatches, can be viewed on www.channel4.com/programmes/dispatches/.../episode-1
[2] Assessment scales can be viewed at nationalstrategies.standards.dcsf.gov.uk/node/83972
[3] Dehaene, Stanislas. [1977] The Number Sense: How the Mind Creates Mathematics, p8 (Introduction), Penguin Press, London,
[4] Source taken from article of Cheryl Ferreira, [2000] The Mathematical Mind, AMI Communications 2006/2, and further quotation from Dehaene, as above, p5
[5] Verheul, Joke. [2008]. Montessori and Tools for Life, AMI Communications, 2008/2, p64-69
[6]Montessori, Maria. [1934] Psychogeometry and Psychoarithmetic, AMI Communications 2007/2 p12
[7] Ibid, p 13
[8] Montessori, Maria. Creative Development in the Child, Volume Two, p 23

Dear Maria...

Should we allow our children to play outside unsupervised?

In July of this year a London couple who were allowing their daughter, eight, and son, five, to cycle a mile unsupervised from their home to their junior school were told by the headmaster that unless they began to supervise the journey they would be referred to Children's Services. [1] In September another father received a letter from his local council threatening to report him for allowing his seven-year-old daughter to walk unaccompanied twenty metres from their home to the bus-stop on her journey to school. [2] What did Dr Montessori say about giving children of this age the freedom to go out unsupervised?

No education ethos can guarantee the safety of a child in the outdoor world and Dr Montessori certainly never suggested that parents let their children run wild without supervision, but she did insist that children aged between six and twelve years actually need to spend time outside the safe haven of the home.

One of her reasons for this stipulation was her observation that this six year period is a time of social development. A six-year-old child can communicate well, can look after himself physically and feels less dependent on his family than he did in his early years. Although he still needs the love and support of his family, he is now curious about how the outside world functions. He wants to understand how things work, but more specifically he wants to understand how society works and how he fits into it. He instinctively feels drawn to spend time with his peers, and become part of a 'group' within which he can learn about how a social hierarchy functions. In Dr Montessori's words:

'A fact to be observed in the child of six is his need to associate with others, not merely for the sake of company, but in some kind of organised activity. He likes to mix with others in a group wherein each has a different status. A leader is chosen, and is obeyed, and a strong group is formed. This is a natural tendency, through which mankind becomes organised.' [3]

It is more than simple gregariousness. Rather it is as if they are role-playing social scenarios in preparation for adulthood. Furthermore, it is through these experiences that another aspect of social development comes to light: the development of moral judgement. The six-year-old child no longer thinks that everything that the adult says and does is right and so his moral judgement cannot advance just by him being told what is right or wrong or how to act; instead he has to live through scenarios for himself in order to develop consideration and compassion for others. As Dr Montessori wrote,

'A second side of education at this age concerns the child's exploration of the moral field, discrimination between good and evil. He no longer is receptive, absorbing impressions with ease, but wants to understand for himself, not content with accepting mere facts. As moral activity develops he wants to use his own judgement'. [4]

So if we recognise that this time spent with peers is more than just playtime and can be viewed as an opportunity for personal development, then we should consciously offer our children these opportunities. Of course schools do allocate a certain part of the day to free play, but it tends to be minimal and restricted to the playground. Dr Montessori also noted that the more varied the encounters a 6-12 year old child has with society, the more advanced his social skills will become.

In her day she used to say that 6-12 year old children would benefit from joining the Scouts. A group like the Scouts allows the child to explore in an

environment outside home and school as well as satisfying his need to test out the rules of society within a group that has a good moral code; there are strict rules pertaining to what one should and shouldn't do and the child is expected to make a commitment to the group. He is expected to take responsibility for his own actions and also to take into consideration the needs of others. What's more, camping out offers physical challenge to the child.

The 6-12 year old will also benefit from time spent helping the community; visiting a nursing home or participating in community projects. The more outdoor experiences the child has, the more information he gathers about the world and the more varied the topics about which he can ask questions and form opinions. Even something as simple as walking home, accompanied or not, rather than being driven home, opens up opportunity for mental growth; how does he feel passing a beggar on the street or someone throwing litter on the floor?

There is certainly something to be said for a child having the freedom to go out without adult supervision; to truly grasp 'life lessons' such as whom and what to trust or what to do when one gets lost or how to cross a road safely. The child will eventually have to learn without his parents present. But Montessori did not suggest that we just abandon children to cope by themselves – she was a great advocator of preparation. Parents can help their child prepare for a trip out, such as a visit to the local library, shop or cinema: they could work out the best route there and discuss potential problems that may arise and how the child would deal with them. The child can do the research for himself as well as gathering the appropriate clothes, equipment, food and money.

Sue Palmer, renowned campaigner for the protection of childhood, says that many children these days have a solitary, sedentary, screen-based lifestyle outside school due to two reasons: firstly the lure of TV and computer games and secondly an increase in parental anxiety resulting in restrictions on children's freedom outside home and school. This worries her greatly because 'The glorious thing about play is that it's fun: the young of every species are designed by nature to learn fundamental physical, social and emotional lessons through sheer enjoyment.' [5]

She emphasises the need for children to spend some time away from adult supervision in order to 'learn about the world, develop their physical co-ordination and control and grow in independence' as well as to 'make judgements, take risks, learn how to make friends and elude enemies.' [6] The first excursion could be for a limited time - the child could walk to the local shop, for example - and if the parents are very worried the child could take a mobile phone. After he has done this several times and the family is more confident, the freedom to roam can be extended gradually over time. In addition, if parents make contact with other parents and members of the community - the postman, lollipop lady, shopkeepers - they can establish a neighbourhood watch on children who go out.

The importance of responding to the child's need for social development at this age cannot be underestimated. As he grows into a teenager he will want to try to understand himself, and if he does not understand how people interact with each other, how can he ever understand himself? He will want to go out and about by himself, but if he has never been given any opportunity to do this he will not have developed any capacity to do this safely – and at an age when risk-taking is 'de rigeur' wouldn't we all be happier if our children understood how to keep themselves safe?

Gayle Wood, AMI Diploma Holder

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