THE MONTESSORI APPROACH TO

Numeracy

AT BISHOP'S CONSERVATORY JUNIOR SCHOOL



SKOLA-KNISJA

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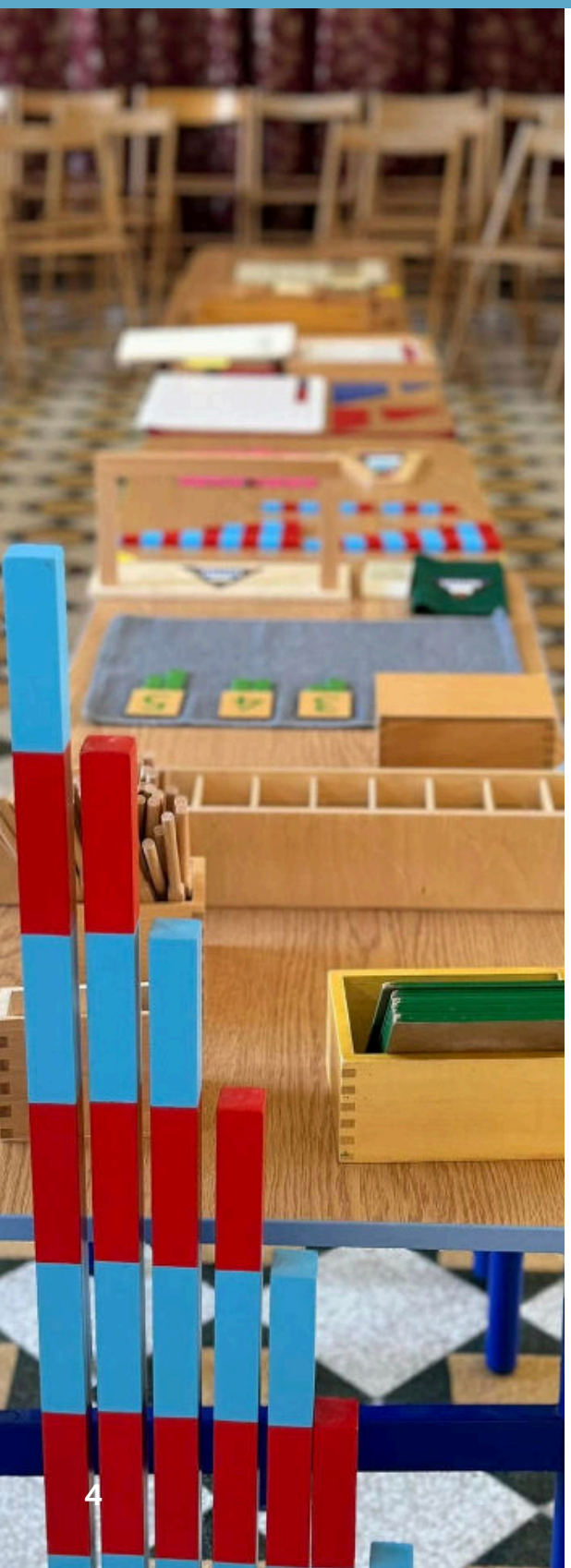
... ALSO INCLUDED IN THIS MODULE

A video demonstrating how the Montessori Addition Sequence is presented to learners in practice.

SKOLA-KNISJA

Introduction

Numeracy in the Montessori Curriculum



This course explores various aspects of the Montessori approach to learning and teaching numeracy in the early years, providing information on the main strategies underpinning the approach, on the main characteristics of the numeracy materials and on how each child's progress is monitored and recorded. Drawing on primary and secondary sources on how children develop abstract concepts, as well as our experience at our school at Bishop's Conservatory Junior School, Gozo, Malta, learners will examine the principles of scaffolding, auto-education and self-correction, active and concrete learning and how the adult serves the child's innate tendency for order, precision and exactitude to develop numeracy skills.

Across the course, learners will explore the difference between numeracy, arithmetic and mathematics; will explore how strategies such as indirect preparation, repetition, scaffolding and going from concrete to the abstract are implemented in practice; they will learn what the Montessori numeracy curriculum covers and how the adult monitors academic progress.

By the end of the course, learners will understand why such an approach to learning numeracy in early years education is fundamental both for our children's growth and to the real-world application of learned skills.

We invite you to begin by assessing your current understanding of the Montessori approach to numeracy in the early years before undertaking the tutorial.



Mr Elton Vella
Head of School
Bishop's Conservatory Junior School

Definitions and Distinctions

What is **Mathematics**?

Mathematics is basically the study of numbers, patterns and shapes. It can be defined as a formal and broad study of numbers, quantities, geometry and forms. Mathematics has developed from counting, calculation, and measurement with the use of logic and abstraction, and systematic study of shapes and motions of physical objects. Moreover, it is useful for solving real-world problems, and the knowledge of mathematics is useful for many fields such as science, business, engineering, construction, and social sciences.

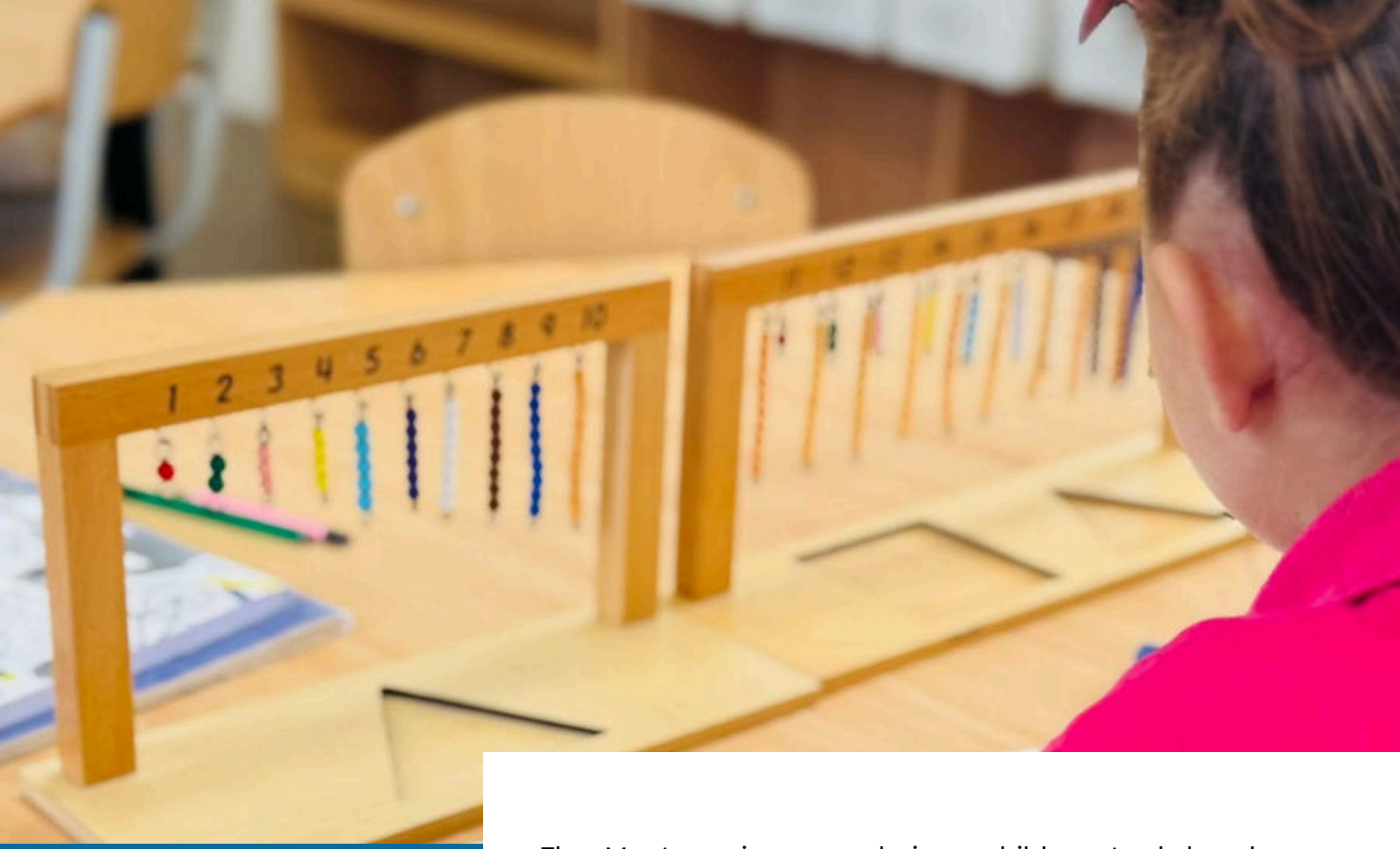
And what is **Numeracy**?

On the other hand, numeracy is the ability to understand and work with numbers. In other words, it is a form of mathematical literacy, which involves the ability to use numbers and solve problems in real life. Numeracy involves the ability to reason and understand simple mathematical concepts. It's much more than doing sums; it involves interpreting charts, data and graphs, processing information, solving problems, understanding and explaining solutions, as well as making decisions based on logic and reasoning.

In summary, the main difference between **mathematics** and **numeracy** is that Mathematics is the broad study of numbers, quantities, geometry and forms while numeracy is one's knowledge and skills in mathematics and its use in real life.

And what about **Arithmetic**?

Arithmetic is the oldest and the most basic branch of Mathematics. It deals with numbers and the basic mathematical operations like addition, subtraction, division, and multiplication.



Strategies for Teaching and Learning Numeracy

The Montessori approach is a child-centred, hands-on method that fosters cognitive and functional independence and lifelong learning.

Its **key principles** include:

- A carefully prepared environment
- Mixed-age classrooms that support social learning theories
- Encourages self-directed work
- Allows for uninterrupted periods of child-initiated work
- Makes the learning relevant
- Allows freedom within limits
- Responds to the child's natural predispositions
- Is holistic and organic
- Sees the teacher as a guide
- Has a sequential and precise curriculum that is flexible to accommodate each child's unique needs and interests

More specifically, the Montessori approach to numeracy offers:

- **Concrete and tactile experiences** before moving to abstract concepts, allowing children to "feel" quantities using manipulative materials.

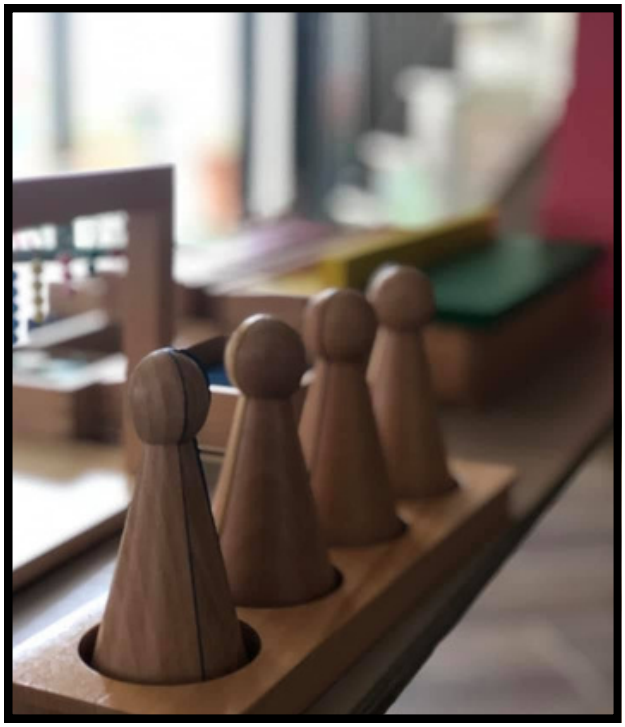
- **Child-led learning** where the educator offers activities and the child chooses when, where, and with whom to work.

- **Self-paced progress** where each child is given the time and space to work on each concept or material for as long as it is needed.

- **Specialised scientific materials** to build deep number sense and materialised abstraction*. Numeracy materials are built with precision and exactitude to support the child's mathematical mind and the exactness of the science of numbers.

- **Self-correcting learning,** whereby children use control of error tools to check their work without the need for an educator to formally mark it. This strategy enables children to independently find solutions to their mistakes and assess their own learning.

NB: Erasers ARE NOT typically used in the Montessori classroom as mistakes are seen as important tools for learning and not something to hide.







***Materialised abstraction** - a core Montessori concept where physical, hands-on materials represent abstract ideas. By touching, manipulating, and repeating work with these materials, children internalise complex concepts through muscle memory, moving from concrete understanding to mental abstraction.

ADDITIONAL STRATEGIES
in the Montessori Numeracy Curriculum

1 In a Montessori setting, the educator's planning follows the child's interests. Montessori activities can therefore be modified to include the developing interests of children.

The Spindle Box

For example, counting loose quantities with the Spindle Box can be changed as below for a child interested in natural objects.



Cards and Counters

Similarly, counting with the Cards and Counters can be modified to support a child's interest in natural objects.





2 The child's physical and cognitive pre-numeracy abilities are developed through indirect preparation in the early areas of the Montessori Curriculum especially through Activities of Everyday Living and Sensorial. For more details about this, refer to the next chapter.



3 Some materials use colour coding to support mental organisation. For example the Large Number Cards (below) are differently coloured to support the child's differentiating between the hierarchies (units, tens, hundreds and thousands).

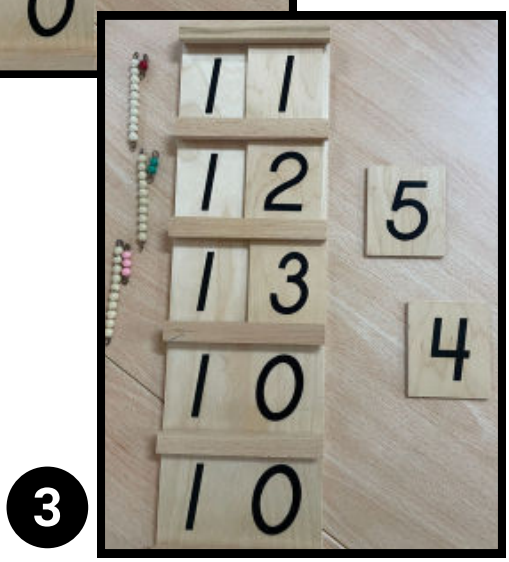


4 Each new concept is introduced in isolation, then combined.

For example, when learning about the teen numbers, children are introduced to the quantities in isolation first (as seen in the first photo below), then their symbols in isolation (as seen in the second photo below) and then this knowledge is combined (as seen in the third photo below).





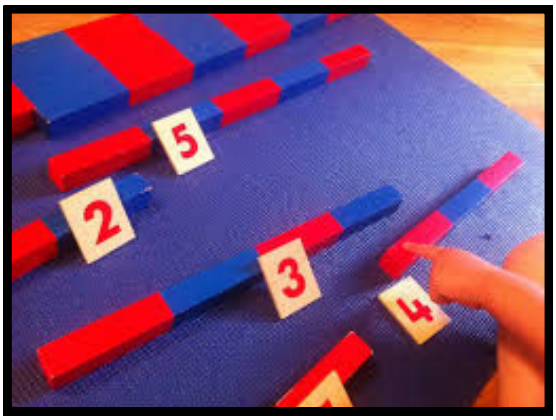


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Repetition of the concept via different modes of learning is a must.

For example, when teaching children to count from 0 to 10, various types of materials are used, such as:

The Number Rods



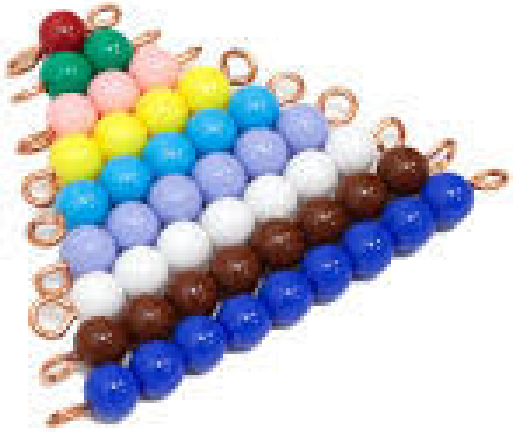
The Spindle Box



The Cards and Counters



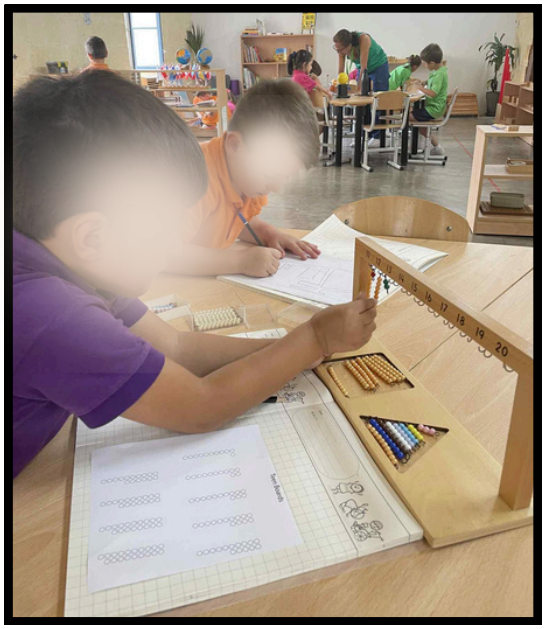
The Short Bead Stair



6

Learning occurs from concrete to the abstract.

For example, addition is learnt through repetition with a wide variety of different exercises, leading to mental arithmetic towards the very end. Abstraction is therefore based on sound cognitive understanding of addition and its materialised abstraction rather than from rote learning.



Indirect Preparation for Numeracy

THE READINESS OF THE CHILD

A child's readiness to learn, often termed "school readiness," is a holistic state of development rather than just academic knowledge, encompassing social, emotional, physical, and cognitive skills.

It involves the ability to regulate emotions, show curiosity, follow instructions, and interact positively with peers. A secure home life, play-based learning, and consistent routines are crucial to building this foundation, preparing children to thrive in a structured school setting.

In a Montessori classroom, children are first introduced to areas of the curriculum that encourage the development of foundational skills such as independence, self-regulation, attentive listening, concentration and focus.

Other important **pre-numeracy skills** include, but are not limited to:

- Matching and Pairing - in numeracy we match the quantity to its symbol.
- Sequencing - Numbers are always in a sequential order.
- One-to-one correspondence - Each quantity has only one corresponding symbol.
- Sorting and grouping - When working with higher hierarchies such as units, tens and hundreds, quantities need to remain in their hierarchical group and order.
- More and less
- Patterns - Numbers and arithmetical results are often in a visible pattern.
- Estimation
- Problem solving
- Making connections.







These skills also meet the needs of the child's mathematical mind, the innate, universal human capacity to **organise**, **classify**, and **quantify**.

In order for children to be ready to fully engage in the Montessori numeracy materials, other skills are necessary to maximise learning. Such skills include:

Confidence

Independence

Fine Motor Control

Creative Thinking

Social Skills

The Activities of Everyday Living and the Sensorial areas offer the most suitable activities for the development of the above skills that are crucial for the learning of more academic subjects such as literacy and numeracy.











Activities of
EVERYDAY LIVING

Montessori Activities of Everyday Living, or Practical Life, as sometimes they are called, are purposeful everyday tasks that foster independence, concentration, fine motor skills, and coordination in children. These activities generally fall into four key areas: care of self, care of the environment, grace and courtesy, and control of movement. Examples include pouring, washing, dressing, and cleaning, which help children gain confidence and foster functional independence.

Activity 1

Pouring into two identical containers



Children are encouraged to fill the two identical containers so that they hold the same amount of water.

Skills developed that support numeracy include:

- **fraction / division** as the child divides the water into two equal parts
- **estimation**
- **attention to detail and concentration**
- **fine motor control**

Activity 2

Transferring and sorting with tongs



Children are encouraged to transfer and sort the beads by colour in the relevant bowl using tongs.

Skills developed that support numeracy include:

- **matching** as the child matches the colour of the beads to the bowls
- **grouping / sorting** as the child creates subgroups according to colour
- **concentration**

Sensorial

Maria Montessori viewed sensorial materials as foundational, acting as a "key" that brings order to a child's sensory impressions.

While not a direct verbatim quote, this concept emphasises that sensorial work provides the "alphabet" for understanding the world by classifying size, shape, and colour.

As children work with the precise and exact sensorial apparatus they also satisfy the needs of their mathematical mind.

According to Montessori, children are naturally inclined toward mathematical thinking long before formal instruction begins. She believed that mathematics is not merely a school subject but an inherent way in which the human mind organises and understands reality.

Contemporary research in cognitive science and neuroscience strongly supports this perspective, validating Montessori's observations through empirical evidence.



Activity 1 - Colour Box 3

The child selects one colour and orders the seven tablets from dark to light or vice versa.

Skills developed that support numeracy learning:

- **Matching** by colour
- **Sequencing** by shade of the same colour
- **Sorting / grouping** tablets of the same colour
- **Concentration**
- **Fine motor skills**

Activity 2 - The Binomial Cube

The child rebuilds the cube inside the box by matching the pattern on the lid.

Skills developed that support numeracy learning:

- **Matching / grouping** by colour, size and shape
- **Patterns**
- **Problem solving**
- **Geometry**
- **Concentration**



THE MONTESSORI EARLY NUMERACY CURRICULUM
an overview

On the Montessori shelves the child can find a wide variety of different activities that offer hands-on learning experiences, supporting the development of a sound understanding of number concepts and operations.

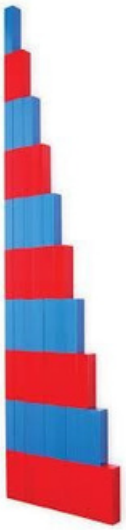
All materials are carefully organised on low shelving units for easy access; they are grouped according to number concepts and are in sequential order to ensure appropriate scaffolding.

The following is a comprehensive list of Montessori numeracy activities. Montessori educators often add to these activities with handmade ones that are reflective of a child's particular need and interest.



Large Number Rods

With this early numeracy material, the child works with concrete representation of each quantity from 1 to 10. The child places the 10 rods in order of quantity, then the educator supports them in counting each rod and in saying the number out loud.



What the child learns with the Large Number Rods:

- one-to-one correspondence when counting
- sequencing when placing the rods in order and when following the educator's instructions
- the increasing order of numbers (always 1 more unit)
- gross motor control

Sandpaper Numerals (SPN)



This is a multi-sensory material that teaches the child the numerical symbols; the child traces each number to internalise their form and their writing direction during the presentation.

What the child learns with the SPN:

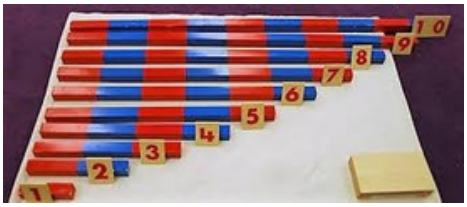
- the symbol for each number from 0 to 9
- fine motor control while tracing the sandpaper strip

Large Number Rods and Cards

This is a revision exercise where the child puts together what they have learnt before. The child matches the rods (placed randomly) with their corresponding symbols, then the rods are placed in sequence and the symbols are matched to create the number line 1 to 10.

What else the child learns with the Large Number Rods and Cards:

- sequencing
- matching
- refinement of gross and fine motor movement
- concentration



The Spindle Box

With this material the child works with loose quantities, having to construct each quantity from 1 to 9 on their own. The number zero is introduced at the end. The sequence of numbers is already in place to facilitate focus on the quantities. This material fosters auto-learning as it contains an important learning feature known as the 'control of error'.

This is how it works: the number of spindles is precisely calculated to complete the exercise correctly; if the child has made a mistake along the way, then, at the end, some spindles will either be left over or there will not be enough. It will then be up to the child to find a way to correct things.

What the child learns with the Spindle Box:

- counting
- sequencing
- matching
- fine motor control
- auto-learning
- problem solving
- concentration, attention and precision



Cards and Counters

This is the last exercise for the consolidation of numbers 0 to 10; the child here uses all their previous knowledge as they organise both loose symbols and loose quantities in order. The child is also encouraged to place the counters in a particular pattern (in pairs) as this activity will later be used to teach the concept of odd and even. This material fosters auto-learning as it contains a 'Control of Error' similarly to the previous activity. If a mistake is made, it will then be up to the child to find a way to correct it.

What else the child learns with the Cards and Counters:

- counting
- sequencing
- matching
- fine motor control
- auto-learning
- problem solving
- concentration, attention and precision



The Short Bead Stair

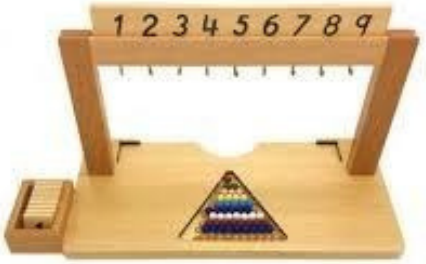
The Short Bead Stair provides a further opportunity to count and order the numbers 1 to 10; this is an important introductory exercise as the Short Bead Stair will be used later on for activities about the teen numbers and the 4 operations (addition, subtraction, multiplication and division).

There is also a Hanging Board for the child to match symbols to quantity.

What the child learns with the Short Bead Stair:

- counting
- sequencing
- matching
- fine motor control as the child holds the beads by the small loop
- problem solving
- concentration, attention and precision









Number Concept
SUBTRACTION

Subtraction with the Short Bead Stairs

This is the first formal exercise for subtraction. The educator introduces the symbol for subtraction calling it 'minus' or 'take away' and then shows how to hide the number to subtract using a small counter. The child then records the answer on a work card. The child is already familiar with the concept of subtraction from everyday experiences in the Montessori and home environments.



What the child is learning:

- to subtract formally and record the answer
- the symbol for subtraction
- attention and focus
- fine motor control
- concentration

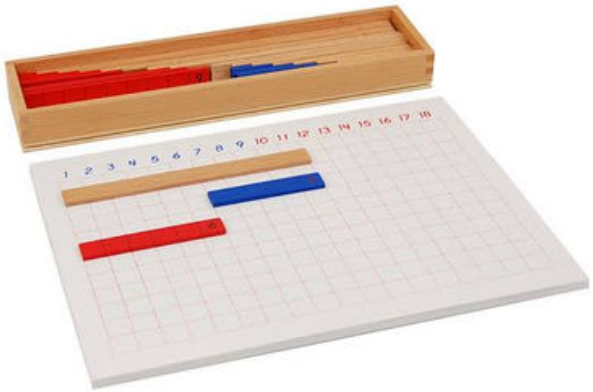
Subtraction with the Strip Board

This material supports the child in working with subtraction in a more abstract way since there are no longer concrete quantities to 'take away'. The child uses a board with strips to work out the answer which is then written down on a work card.

What the child is learning:

- further opportunity to subtract with a different material
- fine motor control
- concentration





Subtraction Tables with the Short Bead Stair

This activity provides children with the opportunity to work with subtraction in a more systematic way, enabling them to discover patterns in the answers. The equations will now be in sequence and not at random like before: for example 9-1=; 9-2=; 9-3=; 9-4= etc. This will support the child's ability to achieve mental arithmetic as they start to memorise answers.

What the child is learning:

- further practice in subtraction
- order and pattern recognition
- memory
- concentration
- fine motor control



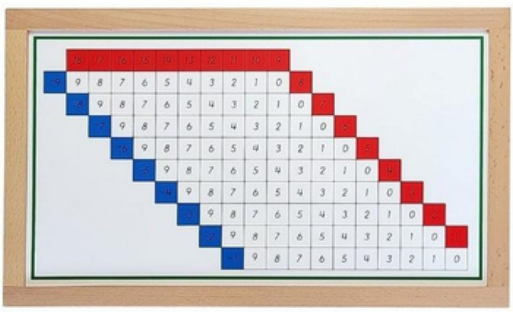


Subtraction Chart A

This is a later subtraction material which supports the child's mental arithmetic through the memorisation of answers. The child takes an equation slip out and using their fingers will find the answer on the chart; the whole equation is then written down on paper.

What else the child is learning:

- further practice in subtraction
- memorisation of answers
- fine motor control such as hand-eye coordination
- concentration

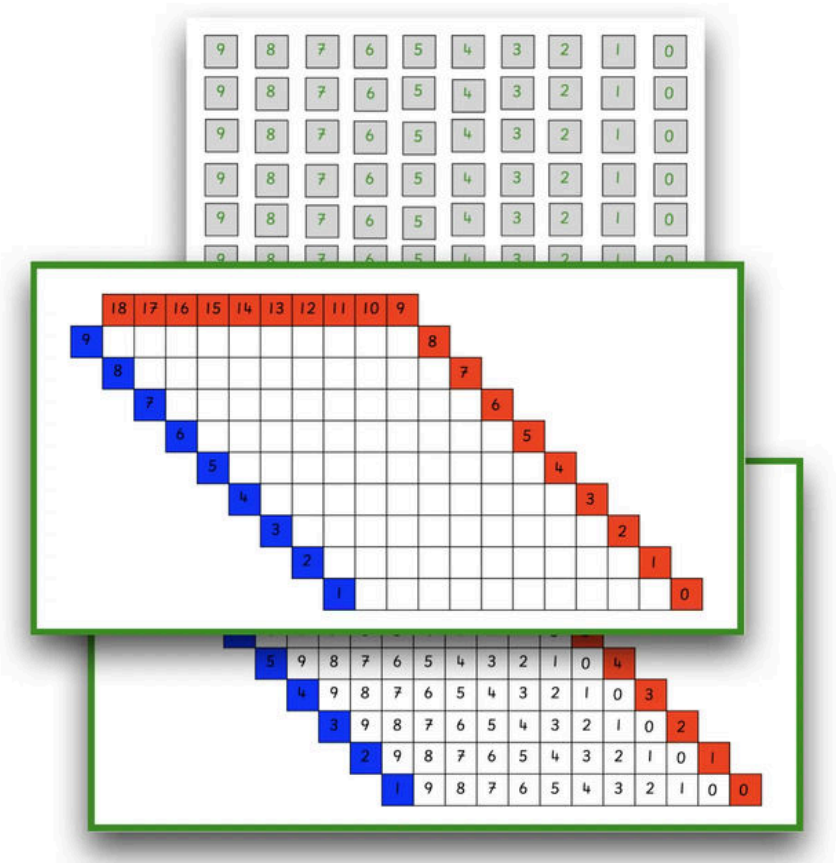


Subtraction Chart B

This material is the final step towards mental arithmetic as the child is given a variety of mixed subtraction equations and needs to recall the answer from memory. Tiles are then placed on the chart where they belong.

What the child is learning:

- to consolidate subtraction facts
- to recognise patterns and relationships between numbers
- to move from concrete to abstract calculations



Number Concept
ADDITION

Watch the video included in this Module for a step-by-step guide about how addition is presented to learners.

SCAN HERE

Number Concept
MULTIPLICATION

Multiplication with the Short Bead Stairs

This is the introductory exercise to multiplication so the child is introduced to the symbol for multiplication and then works systematically through the table card by selecting the right number of bead bars. This enables the child to understand at a concrete level the concept of multiplication (the addition of equal sets).

What the child is learning:

- Multiplication
- Patterns
- Counting
- fine motor control
- concentration

Multiplication Tables with the Board

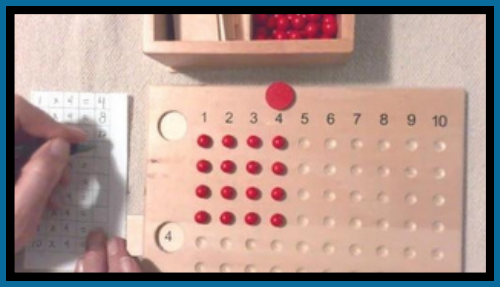
After the previous exercise, the child extends their knowledge and understanding of multiplication by working with the board and constructing each quantity independently. The skill of counting on from the previous answer is also encouraged.

What the child is learning:

- Multiplication
- Patterns
- Counting
- fine motor control
- concentration



Multiplication with the Short Bead Stairs



Multiplication Tables with the Board



Multiplication Charts A and B

Number Concept
DIVISION

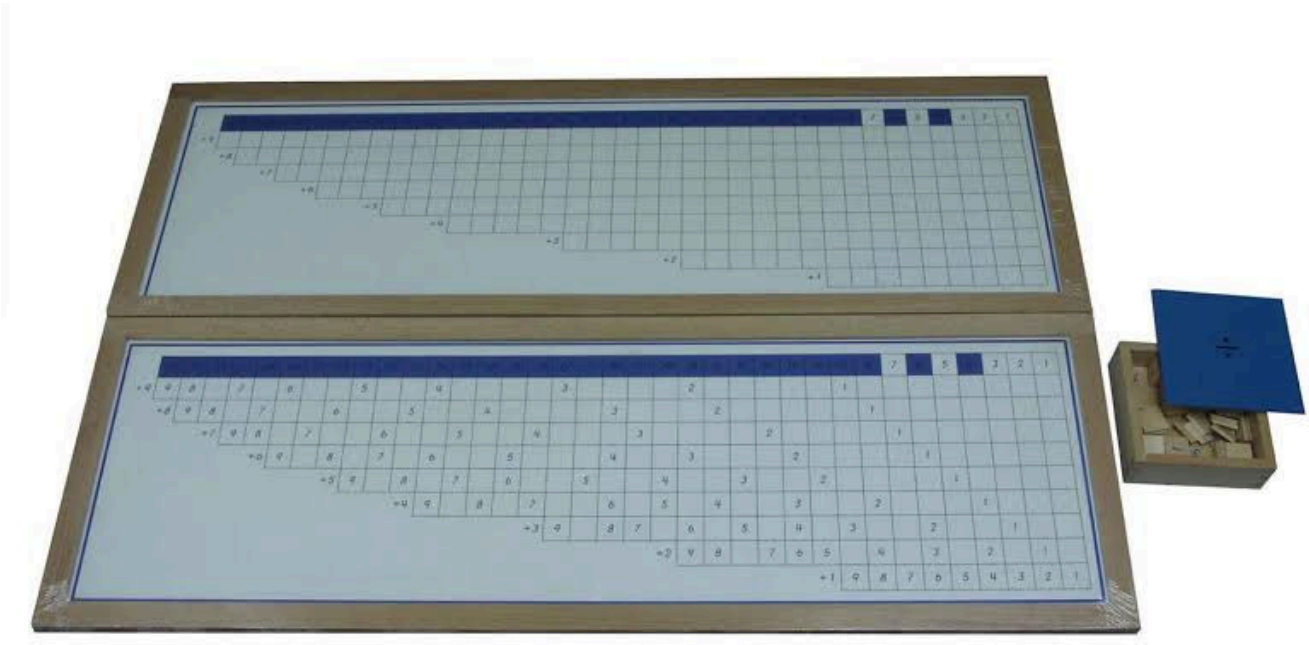
Division Tables with the Division Board

This activity introduces the child to the symbol for division and enables them to work with this concept more formally. The child shares green beads equally among the appropriate number of skittles and records the answer in a pre-prepared exercise card. At a different time the concept of remainder will also be introduced.

What the child is learning:

- How to carry out division equations
- The symbol for division
- Sharing equally
- Patterns
- Counting
- fine motor control
- concentration

Division Charts A and B

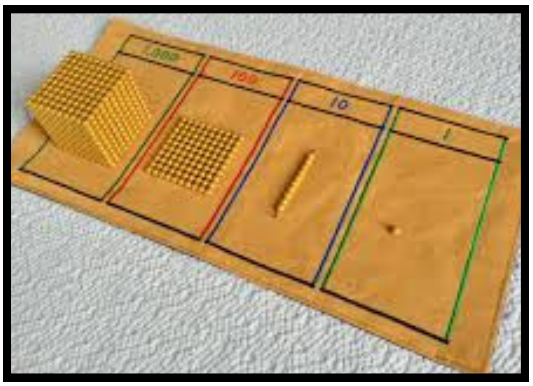


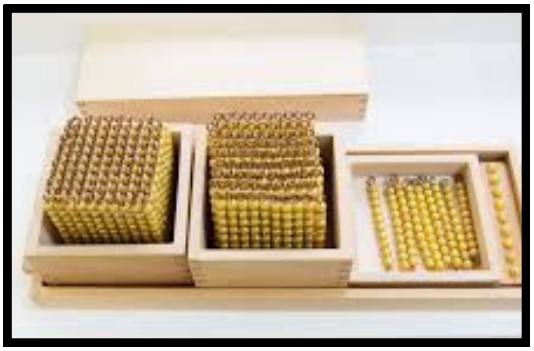
Number Concept
THE DECIMAL SYSTEM

Introductory Exercises with the Golden Beads

1. **Naming the Quantities**

In this introductory exercise the child is introduced to the names of the four hierarchies, the units, tens, hundreds and thousands and their corresponding place value on a colour coded mat.





2. **Counting Through of the Quantities**

The concept of the decimal system (working on the base 10) is concretely explored with these materials; the child counts nine quantities within each hierarchy and then moves on to the next.

3. **The Bead Bank**

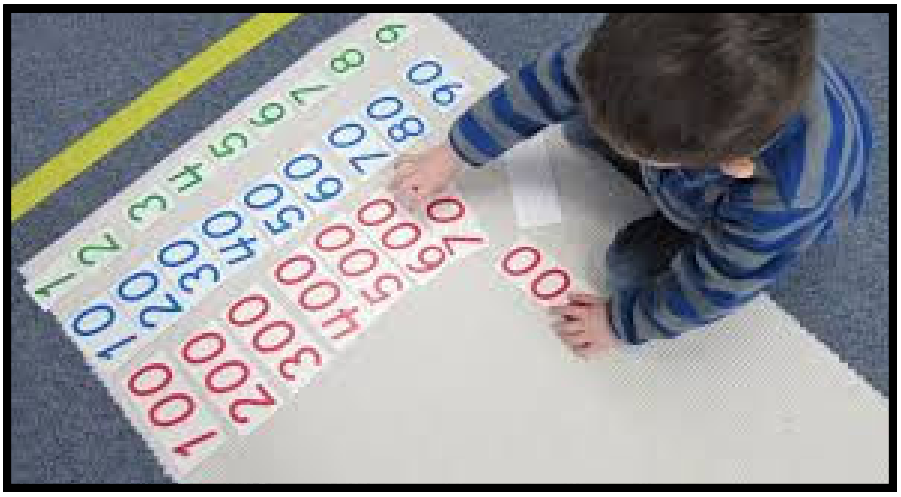
The child is encouraged to select a given amount from the bead bank. This encourages consolidation of knowledge of the hierarchies and of their place value.



4. **Naming of the Symbols with the Large Number Cards (LNC)**



5. **Counting Through the Symbols**



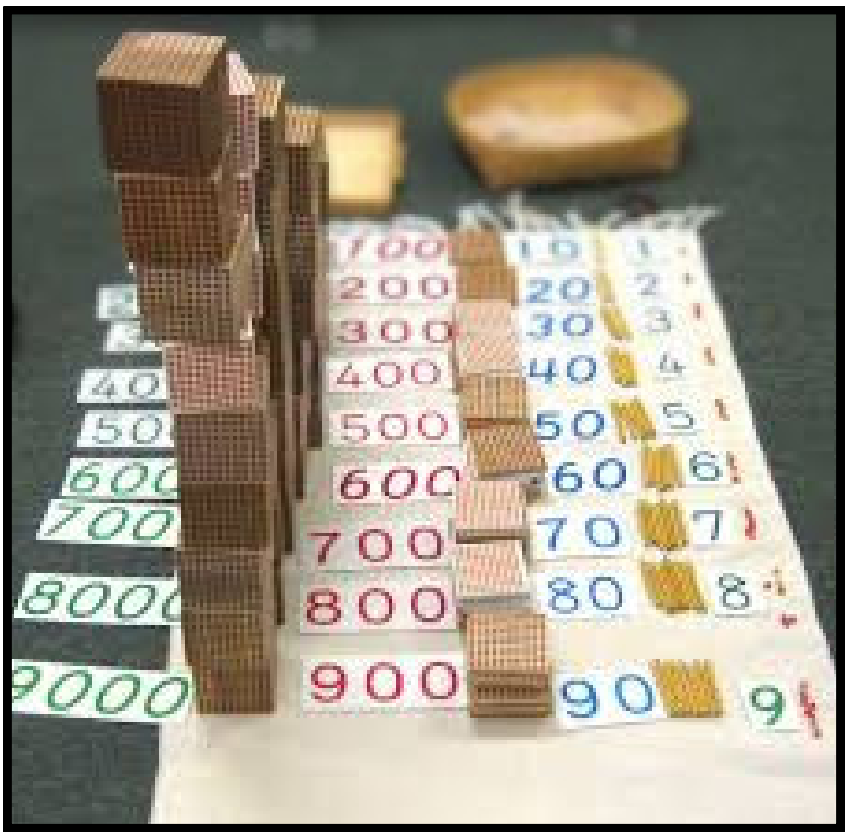
6. **Practice with the Symbols**



7. **Combined Practice**



8. **Birds' Eye View**



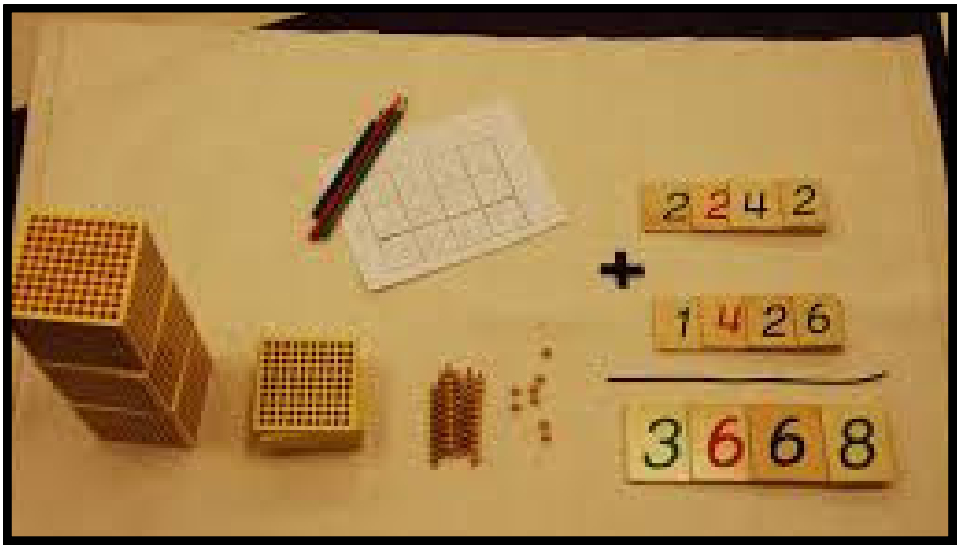
9. **The Changing Game**

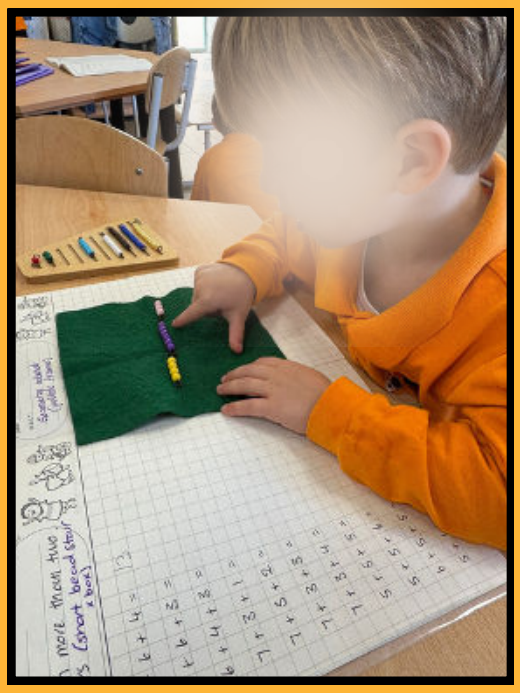
This exercise enables children to explore the concept of carrying over.

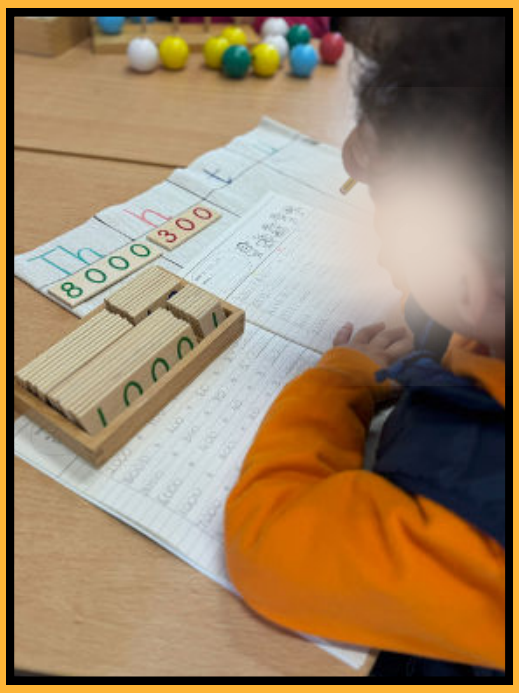
The Four Operations with the Golden Beads

Children use small and large number cards to represent numerically the quantities they have collected from the Bead Bank and carry out the operation by concretely handling and counting the golden beads.

The picture below shows group addition using the Golden Beads. All four operations (addition, subtraction, division and multiplication) are carried out this way.







Number Concept
HIGHER NUMBERS THAN 10

Teen Numbers

The child is introduced to the teen numbers (11 to 19) by working with the concrete quantities first, then their symbols by using the board, before combining quantities and symbols.



Numbers 20 to 99



The child is introduced to the higher numbers by working with the concrete quantities first, then their symbols by using the board and by then combining quantities and symbols.

Concept FRACTIONS

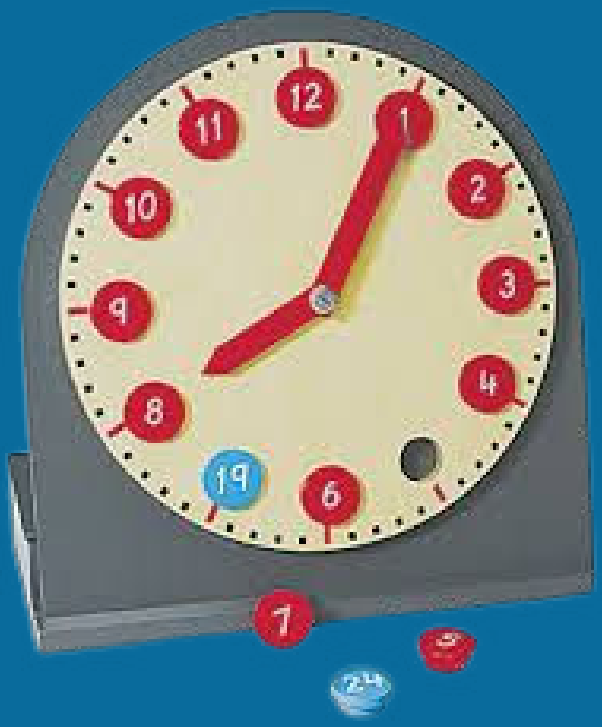
With the fraction materials the children will be able to grasp a sound understanding of the concept of fractions and their symbolic representation.





Concept TIME





The Montessori Numeracy Materials

CHARACTERISTICS SUPPORTING NUMERACY STRATEGIES



> "Movement of the hand is essential. Little children revealed that the development of the mind is stimulated by the movement of the hands. The hand is the instrument of the intelligence. The child needs to manipulate objects and to gain experience by touching and handling."

Dr Maria Montessori,
the 1946 London Lectures, p 36

The Montessori materials are:

Concrete and sensorial

Montessori materials are intentionally designed as concrete, hands-on, and sensorial tools that allow children to explore, manipulate, and internalise abstract concepts through their senses. These materials enable children to learn through physical experience and self-correction rather than verbal instructions.

Reality-based

All resources are real and functional as this will prepare the child for real life outside the classroom. Therefore, when introducing concepts such as telling the time, measuring and money, only real equipment is used such as a real clock, real coins and real measuring tape, jug and scales.

Isolating one quality or concept

In Montessori education, **isolation of one quality** is a design principle where sensory materials focus on a single attribute—such as size, colour, texture, or sound—while keeping all other variables constant. This focus allows children to analyse specific sensations, fostering concentration, mental order, and cognitive discrimination by removing distractions.

Resource Review

TEACHING THE TIME





Consider these two differently designed resources for teaching children how to tell the time and evaluate their effectiveness for the purpose they are created for.

Exact and precise

Every piece of apparatus has been designed and constructed with the utmost precision. For example: each unit of the number rods measures 10 cm; the one-hundred square of the Golden Beads contains one hundred unit beads etc.

Durable, well made and aesthetically appealing

All Montessori equipment is designed and manufactured with the utmost precision and attention to detail. This is particularly true and important for the numeracy materials as numbers are a precise science. For example, the one thousand cube of the Golden Beads materials contains precisely one thousand units, one hundred ten -bead bars and ten one hundred squares (see photo below). This precision allows children to discover the relationship between all the hierarchies.



The materials are also made with beautiful materials such as wood and glass; this contributes to their appeal and the joy of manipulating them. As Montessori said:

> "...the brilliancy, the colours, and the beauty of gaily decorated objects are nothing more than "voices" which attract the attention of a child and encourage him to act."
>
> Dr Maria Montessori,
> The Discovery of the Child, p 85

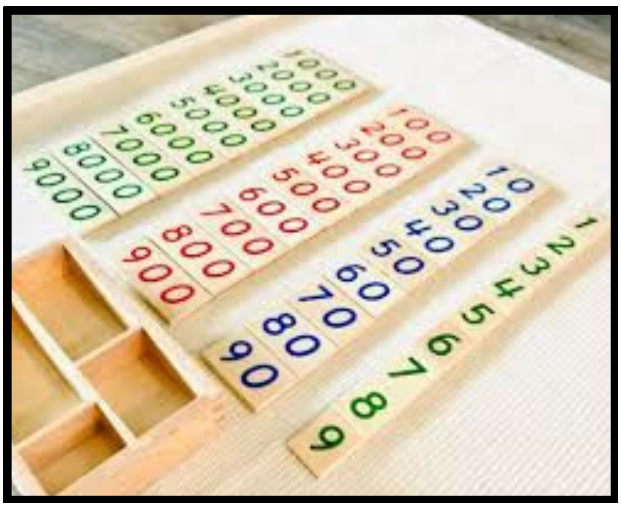
Child-sized

All Montessori materials are intentionally child-sized to foster independence, self-mastery, and concentration by matching the physical abilities of young children. The materials, furniture, and tools are scaled down for easy handling, manipulation, and access, reducing frustration and allowing children to work comfortably.

Colour coded

The colours present in Montessori materials are mainly a teaching and learning tool. Children in the early years still use their senses to gather information from their surrounding environment, allowing for a more concrete experience. Therefore, by using the chromatic sense, the children are able to classify objects and concepts more easily. For example, the colours in the Large Number Cards and in the operation mat enable the children to organise numbers and quantities in their relevant hierarchies as they work out different equations. (see photo)





Auto-didactic

Montessori materials are designed to be auto-didactic (self-teaching) and self-correcting, allowing children to learn independently without constant adult intervention, support and correction.

Self-correcting

Materials also feature a 'control of error' mechanism, enabling children to recognise their own mistakes; this fosters independence, problem-solving skills, deep concentration and resilience. For example, the Montessori Spindle Box (see photo) contains the exact number of spindles for the children to match with their relevant numbers; if an error is made along the way, there will either not be enough spindles for the number 9 or there will be some left over.



Repetition

Repetition in the Montessori approach is a fundamental, child-led process where children voluntarily repeat activities to master skills, deepen concentration, and build inner confidence.

Driven by internal sensitive periods and innate human tendencies, this repetition transforms learning into deep mastery rather than just rote memorisation, fostering independence and self-discipline.

Scaffolding

Scaffolding in the Montessori approach is implemented in two ways:

1. As the educators provide temporary assistance to help children master new skills when the child is ready; based on careful observation, the guide breaks tasks into smaller, manageable steps, modelling the action and gradually withdrawing help as the child builds confidence and independence.

2. Each concept is presented to the child through a variety of different activities that support learning and consolidation as a step-by-step process, where the child uses the knowledge acquired with the previous activity to work with a new exercise which will introduce a new skill.

Real-world applications

Real-world applications in learning help bridge theoretical knowledge with practical experience, increasing student engagement, critical thinking, and retention; this way education becomes relevant to daily life and the future. This approach shifts learning from passive memorisation to active learning.

An example of a real-world application

The children first learn about money in the Montessori classroom with reality-based activities such as the one in the photo; this activity is carried out as a role-play scenario where children act the role of a shopkeeper or a customer that buys items. Then children are encouraged to use this knowledge as they organise fundraising activities for the school or as they go shopping for a cooking activity/school event or as they buy ice cream at the end of a school outing.



Assessment of Progress
IN THE NUMERACY CURRICULUM

In a Montessori classroom, progress is assessed through unobtrusive observations carried out across learning opportunities, rather than only during specific presentations. A Montessori teacher knows that learning occurs organically, holistically and as the child engages in informal situations and therefore observations and assessments can happen during creative activities or during lunch/snack time as well as outdoors.

The **key features** of assessment in a Montessori classroom include:

- Ongoing Observation: The most critical tool, where guides carefully watch children interacting with materials and each other to evaluate their progress.
- Individualised Records: Teachers keep meticulous notes on lessons given, mastery levels, and observations on a child's development.
- Student Self-Evaluation: Students frequently reflect on their own work and learning processes.
- Immediate Feedback: Because assessment takes place with the student rather than being done to them, adjustments to teaching can be made instantly. Assessment is mainly formative.

Formative vs Summative Assessment

Formative assessment monitors student learning to provide ongoing feedback, improving teaching and learning during the process. Conversely, summative assessment evaluates student learning at the end of an instructional unit by comparing it against a standard (final exams).

The Key Differences

	Formative Assessment	Summative Assessment
Purpose	to monitor progress and improve learning	to evaluate final proficiency
Timing	occurs *during* the learning process	occurs *at the end* of a unit or course
Stakes	low-stakes or ungraded	high-stakes and typically graded
Feedback	provides immediate, actionable feedback to adjust teaching and learning	offers delayed, final feedback

Types of Formative and Summative Assessment

Formative Assessment	Summative Assessment
• Discussions • Recorded observations • Diagnostic questions • Weekly quizzes • Student self-assessments	• Final projects • Standardised tests • Semester exams • Final portfolios

Why Both are Necessary

Using both in conjunction ensures that learning is both supported through continuous improvement (formative assessment) and validated for proficiency (summative assessment). Formative assessments change the learning trajectory, while summative assessments document the final achievement.

Recording Formative Assessments

Formative assessments can be recorded through observations and checklists.

Example 1 of a narrative observation of a child's numeracy progress.

Year 1 - six years of age

"X is becoming more committed to completing his maths work each day, with gentle guidance and reminders. Once focused, Andrea is able to complete his work effectively and begins to consolidate many of the year 1 learning outcomes. X has revised doubling of numbers up to ten, some of which he was able to complete mentally. Recently, while working on addition (of unit numbers), X was able to see the pattern of numbers (for example 4 + 6 = is the same as 6 + 4 =) demonstrating growing awareness of the number relationships.

" Furthermore, X has continued finding one more or one less of numbers up to thirty, again working mentally in places. In other areas, X has practised measuring in centimetres, using a ruler, and explored position, direction and movement, reinforcing relevant vocabulary and superlatives. Money work continues in terms of adding coins and he is confident in the notation of the euro and cent. In geometry we have been revising the 3D solids, exploring their properties (edges, corners, faces), and of course their names."

Example 2

Year 1 – 6 years of age



During the past weeks, X has continued to build her numeracy skills through a variety of hands-on Montessori activities. We worked on adding three numbers using the Montessori bead materials, with totals up to 30, and she showed growing confidence when combining quantities and checking her answers independently. X enjoys engaging with concrete materials and is becoming increasingly capable of applying her understanding to new tasks.

As part of our work on positional language, we explored the concepts of left and right through movement-based activities, games, and practical exercises. These experiences supported her understanding of direction and position while helping her develop and use related vocabulary with greater confidence. We also revisited a range of numeracy concepts covered throughout the year, including addition and subtraction, one more and one less, number patterns, 2D and 3D shapes, ordering numbers from greatest to smallest and vice versa, and telling the time to the hour. X participated positively in these revision activities and demonstrated a secure understanding of many of the concepts explored.

More recently, we introduced the concept of half past on the clock. X is making steady progress in this area, and we will continue to reinforce this skill during the coming week.

Example 3

Kinder - 5 years of age

Every day offers a rich and engaging experience, filled with meaningful learning opportunities and a carefully prepared environment where children can explore and acquire new knowledge. It is a pleasure to observe X participating in activities that capture his interest, both independently and with the support of the educator. Through gentle guidance and positive encouragement, he is supported in continuing his learning journey with confidence and curiosity.

In the numeracy area, X is continuing to work with numbers, values, and early mathematical concepts. He is also working in his copybook alongside the educator, where he is learning to complete structured written tasks, aiming to develop concentration, accuracy, and independence.

X has been introduced to the decimal system, where he is learning the names and quantities of units, tens, hundreds, and thousands. With guidance, he is practising counting through these quantities, which aims to build a strong foundation in number sense and place value. He has also been introduced to the Large Number Cards and the Seguin Boards A and B, supporting his understanding of number composition and sequencing.

Additionally, X is learning addition and subtraction using the addition strip board and the short bead stair. These activities aim to develop problem-solving skills, number operations, and a deeper understanding of mathematical relationships.

Example 4

Kinder - 5 years of age

Golden Bead Material – Counting Through the Quantities

Objective: To develop an understanding of quantity and the decimal system using concrete materials.

Observation: X worked again with the golden bead material, revising the exercise of counting through the quantities. Using units, tens, hundreds, and thousands, he practised recognising and naming the different values. This activity helps children understand how numbers increase in the decimal system through hands-on learning.

Golden Bead Material – Bead Practice

Objective: To reinforce understanding of place value and the relationship between units, tens, hundreds, and thousands.

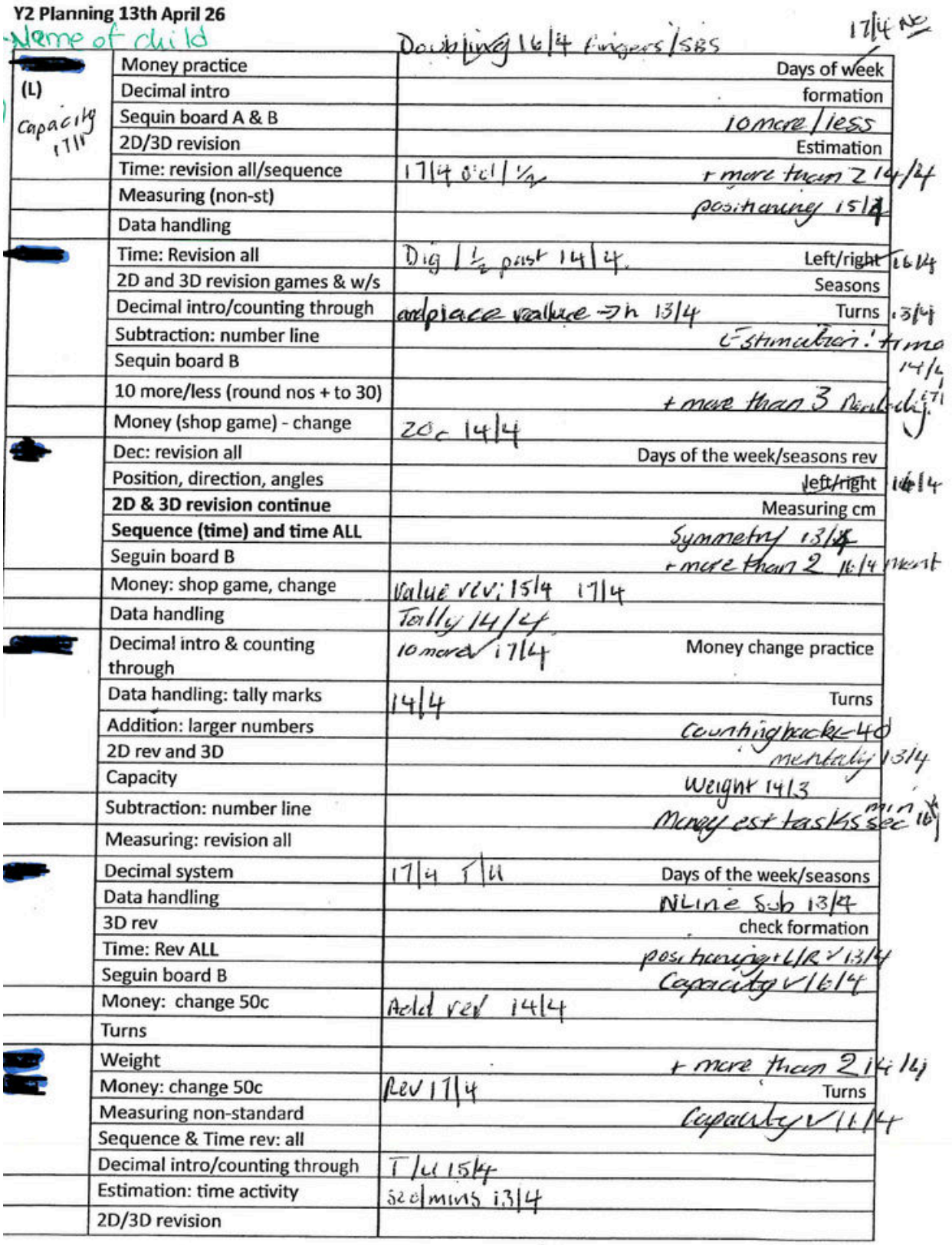
Observation: X was introduced to another exercise – Beads Practice. In this exercise, he worked with the golden beads while the educator named different quantities, helping him recognise and identify the correct beads representing units, tens, hundreds, or thousands. He repeated the activity a couple of times to become more familiar with the concept before moving on to the next stage. This activity supports the development of a clear understanding of place value through concrete materials, e.g. 1435 represented as one thousand, four hundred, three tens and five units.

Writing Number 6

Objective: To develop number recognition, correct numeral formation, and pencil control.

Observation: X practised writing the number 6 in his copybook. He developed pencil control, concentration, and confidence in forming the numeral correctly.

Example of a weekly checklist



Y2 Planning 13th April 26

Name of child

Doubling 16/4 fingers/SBS 17/4 NC

[redacted] (L) Capacity 17/11	Money practice	Days of week
	Decimal intro	formation
	Sequin board A & B	10 more/less
	2D/3D revision	Estimation
	Time: revision all/sequence	17/4 o'cl/½ + more than 2 14/4
	Measuring (non-st)	positioning 15/4
	Data handling	
[redacted]	Time: Revision all	Dig/½ past 14/4. Left/right 16/4
	2D and 3D revision games & w/s	Seasons
	Decimal intro/counting through	add place value → h 13/4 Turns 13/4
	Subtraction: number line	Estimation: time 14/4
	Sequin board B	
	10 more/less (round nos + to 30)	+ more than 3 Mental dig 17/1
	Money (shop game) - change	20c 14/4
[redacted]	Dec: revision all	Days of the week/seasons rev
	Position, direction, angles	left/right 16/4
	2D & 3D revision continue	Measuring cm
	Sequence (time) and time ALL	Symmetry 13/4
	Seguin board B	+ more than 2 16/4 Mental
	Money: shop game, change	Value rev; 15/4 17/4
	Data handling	Tally 14/4
[redacted]	Decimal intro & counting through	10 more 17/4 Money change practice
	Data handling: tally marks	14/4 Turns
	Addition: larger numbers	Counting back 40
	2D rev and 3D	Mentally 13/4
	Capacity	Weight 14/3
	Subtraction: number line	Money est tasks 5 min 5 sec 16/4
	Measuring: revision all	
[redacted]	Decimal system	17/4 T/4 Days of the week/seasons
	Data handling	NLine Sub 13/4
	3D rev	check formation
	Time: Rev ALL	positioning L/R ✓ 13/4
	Seguin board B	Capacity ✓ 16/4
	Money: change 50c	Add rev 14/4
	Turns	
[redacted]	Weight	+ more than 2 14/4
[redacted]	Money: change 50c	Rev 17/4 Turns
	Measuring non-standard	Capacity ✓ 14/4
	Sequence & Time rev: all	
	Decimal intro/counting through	T/4 15/4
	Estimation: time activity	20 mins 13/4
	2D/3D revision	

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This booklet provides a practical introduction to teaching and learning mathematics through the Montessori method. It explores effective strategies for developing numeracy, the importance of indirect preparation, an overview of the Montessori numeracy curriculum and materials, and assessment practices that support children's mathematical understanding.

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