

## Math becomes "Graspable"

Due to the work with sensory materials, the children already have previous mathematical experiences.
The math materials serve as tools to organize and structure those experiences. Through independent learning it makes the world of numbers accessible even to very young children. It supports the development of thought patterns and order structures on an integral level. Math becomes "graspable", because the materials do justice to the children's sensorimotor requirements.
At first, the number range from 0 to 10 is presented. Numeric rods, sandpaper numbers and mandrel box help estimating and comparing. The children learn the respective ways to write numbers as well as their
correlation to amounts and the meaning of the number zero. During the exploration of the subsequent range of numbers, the golden pearl material is assuming the central key function. Numbers and values become meaningful and graspable.
Even very young children work with multi-digit numbers with little effort and great interest. All basic arithmetic operations can be introduced and developed with this material.
After the intensive work with the golden pearl material, the child is offered increasingly abstract materials. Through the "active" handling, children delve deeper and deeper into mathematical thinking. In a playful manner, they learn to think abstractly and logically.

## Mathematics




A 130977 Numerical Rods
B 130382 Stand for Numerical Rods, L39.5 x W9.5 cm
10 massive wooden rods with an edge length of 2.5 cm and increasing length of 10 cm to 1 m . Due to the alternating division into red and blue sections, the amounts 1 to 10 are represented. When arranging the rods, the child is sounding out the numbers and this way, is learning to count. The little number boards are an ideal addition to the numeric rods. This way, each rod (= concrete amount) can be assigned a little number board (= abstract symbol).

C 130433 Small Numerical Rods
Perfectly suited for exercises that shall be done at the table. Contents: 2 sets, each with 10 massive wooden rods that are divided in alternating red and blue units The wooden rods have 1 cm edges and are increasing in length from 2.5 cm to 25 cm .
Warning. Not suitable for children under 3 years. Small parts. Choking risk

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D 130431 Red Numerals
E 130432 Red Wooden Counters, 100 ea.
F 130394 Bin with Numerals and Counters Numerals and Counters
Each number is supposed to be assigned the respective amount of wooden counters. In doing so, the concrete amount is matched with its abstract symbol, the numeral. The number aspect „even" and "odd" becomes clear. The wooden bin contains: 2 Compartments with 55 red wooden counters and the numbers 1-10.

Dimensions: counters $\emptyset 1.8 \mathrm{~cm}$, numbers approx. 4 cm high, bin $15 \times 13 \times 3.5 \mathrm{~cm}$.


130399 Numerals and Signs USA Print
With the wooden numerals and arithmetic operators, addition and subtraction problems can be laid out. Contents: 6 sets with wooden numerals in block letters, arithmetic operators "plus" and "minus" in a wooden bin with lid.

## Mathematics



G 130435 Large, approx. $5.5 \times 7 \mathrm{~cm}$ )
(H) 130436 Small approx. $4 \times 5 \mathrm{~cm}$ )

## Wooden Number Cards

Number cards from 1-9000 made of wood in an open wooden bin.


130506 Introduction to Decimal Symbol Wooden frame with number cards, which vary in length and color ( 1000,10 and 1), to introduce the decimal system. Dimensions: 1000 -tablet $22 \times 7 \mathrm{~cm}$.

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## Info

"The child is the master builder of his own self" (Maria Montessori) -

## Immanent building plan

Each child has the power and ability to build up their personality from the inside out. In doing so, they follow an inner development plan, the "immanent building plan".
Children have the ability of spontaneous self-development. In the course of this, children are extremely sensitive vis-à-vis influences from their environment. In order that children can develop freely and healthily, they need the possibility to advance at their own pace and the freedom to develop according to their own individual abilities.

## Spindle Boxes



## Ten Boards

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G


## Ten Boards

The material consists of two wooden tablets, each of which is divided into 5 fields. In nine of the fields is the number 10, one field remains empty. The children slide the corresponding tablets with the numbers 1 - 19 on the 0 in the correct sequence. Dimensions: Box length 45 x width 16 x height 4.5 cm ; number tablets $7 \times 6 \mathrm{~cm}$.


H


## E 130437 Set 1, Print <br> F 130438 Set 1, Cursive

The Material serves as aid to learn the number sequences from $10-19$. Contents per set: 2 sequin tablets, 9 wooden tablets with the numbers $1-9$ in a wooden box with lid.

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## G 130439 Set 2, Print

H 130441 Set 2, Cursive
Material for learning the number sequence from 11-99. Contents per set: 2 sequin tablets, wooden tablets with the numbers from $1-9$ in a wooden box with lid.

## Info

## Game of Nine

With the game of nine, the children learn and deepen the transition to ten. First of all, the single bead, the bar of ten, the square of hundred and the cube of thousand are individually introduced and placed next to each other. They are compared with each other, to make the differences in size clear. During step 2 , the children are asked to take specific parts of the bead material or to give them to somebody. Only once this works without problems, step 3 follows: The adult points out, for example, the bar of ten and asks: "What is this?"

Then the game start: The adult places 9 single beads on the storage bar, while counting aloud. " $1,2 \ldots$ " After nine, he says "Stop!" This makes clear that there is no space left, and that by adding the 10th bead, the single beads are replaced by a bar of ten, because 10 ones $=1$ ten. The same is done with the tens and hundreds. This way, the children recognize that
10 tens
$=1$ hundred,

10 hundreds $=1$ thousand.

## 130503 Ten Bead Box

Box with 9 golden bars of 10 single golden beads each.
Dimensions: bar $11.3 \times 2 \times 0.9 \mathrm{~cm}$,
box $10.5 \times 8.6 \times 2.2 \mathrm{~cm}$
Warning. Not suitable for children under 3 years. Small parts. Choking risk.

## 130504

Introduction To Decimal Quantity with Trays
Contents: 1 single bead, 1 bar of ten, 1 square of ten, 1 cube of one hundred.
Dimensions wooden box: $33 \times 11.4 \times 3 \mathrm{~cm}$.
Warning. Not suitable for children under 3 years. Small parts. Choking risk.

## 130584

Introduction to Decimal Symbols with Trays
Bead material for illustrating the setup of our number system by groups of ten. Especially accentuated are the transitions to the next place value: Transition to tens, transition to hundreds and transition to thousands.
The set contains: 9 single golden beads, 9 golden bars of ten, 9 golden squares of one-hundred, 1 golden cube of thousand, each with storage bar and wooden storage bin and one wooden tray ( $39 \times 13 \times 2 \mathrm{~cm}$ ).


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Golden Beads


130489
Golden Bead Units 100 ea.
Single, in little plastic box.


130482
Wooden Square of 10010 ea.


130492
Golden Bead Hundred Square


130483
Wooden Cubes of 100010 ea.

130493
Golden Bead Thousand Cube

Info
Golden Bead material
The "Golden Bead Material" makes the different values of the numbers comprehensible. The numerical values are represented by different amounts of beads. The connection between ones, tens, hundreds, and thousands and thus also the overall connection of the entire decimal system becomes graspable. Even very young children work with large numbers without difficulty and with great interest, starting the moment they are able to count to ten. All basic arithmetic operations can be introduced and reinforced with this material.

## Mathematics



130495 Golden Bead chains of 10010 ea

130491 Golden Bead Bars of 1045 ea In a little wooden box.

10 golden bars of ten are joined
to a chain of hundred.


130496 Golden Bead Chains of 1000
10 golden chains of hundred are joined to
a chain of thousand.

## Bead Chains



130485 Frames fo Bead Chains Short Bead Chains Frame

## Arrows



130511 Printed Arrows for Short Bead Chains
10 sets of colored plastic arrows for different exercises with the short bead chains and 10 little plastic containers for storage.


## 130512 Printed Arrows for

 100/10002 sets of colored plastic arrows for different exercises with 100and/or 1000 bead chains and 2 little plastic containers for storage.


## 130513 Arrows for

Complete Bead Materials
20 sets of colored arrows and arrows for single beads 6.35 mm , for chains 12.7 mm , for squares 12.7 mm and for cubes 25.4 mm wide. 20 little plastic containers.
for 25.4 mm wide. 20 lit platic containers.



130497 Black and White Bead Stairs
For addition and subtraction problems.
Warning. Not suitable for children under 3 years. Small spheres. Choking risk.


130857 Ten Bead Box
Contents: 1 box with 1 set of colored bead stairs and 130857 Tray for Bead Stairs 9 golden bars of ten.


130494 Colored Bead Stairs 1 set of colored bead chains from 1-9.



130518 Hanger for Color Bead Stairs With little number tablets form 1-9.
Dimensions: Base plate $30.5 \times 14.5 \mathrm{~cm}$, frame height 20 cm . Number tablets $2.5 \times 3 \mathrm{~cm}$.


130517 Ten Bead Hanger With little number tablets from 11-19.


130858 Tray for Ten Bead Box


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## Addition



## Mathematics

## Subtraction



130488 Subtraction snake Game
The addition problems are now accompanied by subtractions, which are symbolized by the gray beads. The beads are counted and exchanged into golden bead material The final result cannot be lower than 0 in this game. The set contains: 4 wooden boxes with colored lids, 10 set of colored bead stairs, 1 set of black and white bead stairs, 20 golden bars of ten, 5 sets of gray bead chains as well as one plastic chip for counting the beads.
Dimensions: Tray $36 \times 13 \times 4.5 \mathrm{~cm}$,
little boxes $11 \times 8 \times 3.5 \mathrm{~cm}$.
Warning. Not suitable for children under 3 years. Small parts. Choking risk.



## 130453 Subtraction Equations and Differences Box

For laying out the different problems. The wooden box with lid contains: 1 set of little cards with subtraction problems, 1 set of little result cards.
Warning. Not suitable for children under 3 years. Small parts. Choking risk.


## 130507 Elementary Negative

 Snake GameIn this game, the final result can be smaller than 0 . The set contains: 6 little wooden box with lids, 5 sets of colored bead stairs, 1 set of black and white bead stairs, 23 golden bars of ten, 5 sets of gray bead chains, 23 bars of ten, 1 set of red and gray bead stairs as well as 3 plastic chips for counting the beads.

## Info

## Snake Game

The snake game is ideal for introducing addition and subtraction. Using the coloured bead bars and their respective values, addition problems can be solved in a manner that is easy to comprehend for the children: the numerical values (bars), which are to be added, are calculated up to 10 , replaced by golden bars of ten and the problem is solved with the subsequent value of the respective single bar, the replacement bars By and by, the children recognize the values of the bead bars without counting the beads. This way, children move from adding and subtracting by counting to solving the problem by freely calculating it in their heads, learn the tens transitions and the break-down of numbers.

130452 Subtraction Working Charts
The set contains: 1 control card, 2 working charts and one little box with result chips.

Warning. Not suitable for children under 3 years. Small parts. Choking risk.

D 130451 Subtraction Strip Board
The Set contains: Wooden board with $12 \times 18$ fields, 1 wooden box with 9 each blue and red wooden strips in different lengths (from 1-9), 18 natural-colored wooden strips of different lengths in a wooden box. The natural-colored strips serve as cover for unused fields, which ensures better orientation on the board.


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## Multiplication

## 130486 Multiplication Snake Game

The child can lay out multiplication problems and combinations of different multiplication problems. The set contains: 3 little wooden boxes with lid on a wooden tray, 5 sets of colored bead stairs, 23 golden bars of ten, black and white bead stairs.
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## Pythagoras

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(A) 130445 Pythagoras Board

The material serves as aid for learning the multiplication table. It consists of a wooden board and a 2 -piece wooden box with number chips. The wooden board has a frame and 100 fields, which are set up like a chart. On the same, the number chips with the results are placed. Problems shown on the picture: $1 \times 10=10 \times 1$; $2 \times 9=0 \times 2$, etc.
Warring. Not suitable for children under 3 years. Small parts. Choking risk.
B 130446 Pythagoras Board Control Chart

(C) 130455 Multiplication Working Charts

Contents: 2 control cards, 3 work cards and a little box with little result cards.
Warning. Not suitable for children under 3 years. Small parts. Choking risk.

D 130454 Multiplication Bead Board
With this material, all problems of the multiplication table from $1 \times 1$ to $10 \times 10$ can be laid out. In doing so, the multiplier and/or multiplicand is indicated by a red chip and/or a little number tablet that slides in. Problem shown on the picture: $3 \times 6$. Contents: Wooden board with 100 each red beads and wooden tablets from 1-10 as well as one red plastic chip in a plastic container. Dimensions: $25 \times 25 \times 1 \mathrm{~cm}$.
Warning. Not suitable for children under 3 years. Small parts. Choking risk.


130533 Checker Board
With this material, the children can perform and practice multiplications with multi-digit numbers. Dimensions: $80 \times 43 \times 2 \mathrm{~cm}$, fields $7.5 \times 7.5 \mathrm{~cm}$.

E 130536 Number Tiles The wooden bin with 6 compartments and lid contains the wooden number tiles with green, blue and red numerals. Dimensions: $23 \times 16 \times 2.5 \mathrm{~cm}$, number tiles $2 \times 2 \mathrm{~cm}$.

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\text { Narning. Not suitable for children under } 3 \text { years. Small parts. Choking risk }
$$130537 Gray and White Number Tiles with Box

## G 130538 Flat Bead Frame

Frame with 9 rows of moveable golden beads. Children can use this to multiply large numbers. While doing so, the intermediate results can be taken down. The material guides the children to multiplication without aids. Dimensions: $30 \times 24.5 \times 2 \mathrm{~cm}$.

130534 Decimal Checker Board With 49 red, green and brown fields.


## Division



## 130516 Bank Game

Multiple-player game for up to 5 children. Handling of large numbers, the insight into the decimal system and the multiplication are promoted. Contents: Wooden bin with several compartments. Number cards for the multiplicands from 1-9 up to 1000-9000, number cards for the multipliers, number cards for the products from 1-9 up to 1 - 9 million, name cards for the different roles played by the children.


130457 Division Bead Board
This material enables children to lay out divisions with a maximum dividends of 81 and a maximum divisor of 9 . In case of divisions with a remainder, the same will stay on the board as „unfinished row".
Contents: Wooden board, 81 green beads and 9 green skittles in plastic container, 1 green plastic cup. Dimensions: $25 \times 25 \times 1 \mathrm{~cm}$


130458 Division Working Charts
Contents: 2 working charts, 1 control card, set of little result cards.
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For laying out the different problems. Contents: 1 set of little cards with all division problems of the multiplication table from $1 \times 1$ to $10 \times 10,1$ set of little result cards.


Materials for Long Division
C 130527 Plastic Division Tube
© 130528 Beads with Plastic Box, green, 100 ea.
E 130529 Beads with Plastic Box, blue, 100 ea.

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## Division Set

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F 130539 Table of Pythagoras
A decanomial square laid out with bead strings can be replaced by plastic tablets. While the length of the sides could be determined by counting the beads when using the bead material, this is not possible anymore with the tablets. By this abstraction, a further step towards algebra is made. Wooden bin with squares and rectangles in different colors. Dimensions: $31.5 \times 26.5 \times 3 \mathrm{~cm}$, smallest square $1 \times 1 \mathrm{~cm}$, largest square $10 \times 10 \mathrm{~cm}$.
Warning. Not suitable for children under 3 years. Small parts. Choking risk.

G 130544 Colored Counting Bars
Wooden bin with 20 each colored counting bars ranging in length from 1 to 10 .

Warning. Not suitable for children under 3 years. Small parts. Choking risk.

## H 130545 Cubing Material

Subdivided wooden bin with lid. Contains 1 cube and 27 squares each for every number from 1 to 9
Warning. Not suitable for children under 3 years. Small parts. Choking risk.



## Prepared Environment <br> The "prepared environment" should be understood as a learning and development space, which offers stimulation and motivation for the children to use their own initiative. The rooms are designed in a manner that is suited for children's development: furniture and objects are geared towards the needs, size and strength of the children. All materials are freely accessible in open shelves. They are arranged in such a way that they lead the child from easier tasks to increasingly more difficult exercises. Each material has its fixed place, is complete, intact, and only available once. Furthermore, the "prepared environment" means focusing on the essentials. It provides orientation and security to the child. For Maria Montessori, the external order is the basis for finding an "inner order".

130548 Volume Box with 1000 cubes of 1 cm each B 130547 Volume Box with 250 cubes of 2 cm each Volume Box
The natural-colored wooden cubes can be applied in many different ways, as counting material, for laying arithmetic problems and to calculate surface area and volume.

## Info

130498 Colored Bead Chains \& Squares
One set each of colored bead chains and colored squares for the square numbers from 1-10.

Warning. Not suitable for children under 3 years. $S$ mall parts. Choking risk.

This cabinet is „custom-made" for the bead materials. A complete set can be stored well-arranged and easy to reach for children's hands. Dimensions: $115 \times 100 \times 28 \mathrm{~cm}$.


130514 Complete Bead Materials:
Cubes,Squares and Chains
Contains cubes, squares, short and long chains. Please order bead cabinet separately!!

## Mathematics


[C 130540 Small Square Root Board ( 225 holes) incl. 100 blue, green, red beads each
D 130542 Algebraic Peg Board ( 900 holes) Material with a wide variety of application, e.g. fo extracting roots, the determination of products, the determination of the lowest common denominator or for factorizing. Dimensions of the large board for comparison: $56.5 \times 56.5 \times 1.5 \mathrm{~cm}$.

E 130541 Patterns for Square Root Board 4 plastic cards, on which the structure of the extraction of square roots is made clear by the way, the colored areas are arranged.

## 130543 Pegs for the Algebraic Peg Board

 The wooden bin contains pegs in the colors red, green and blue (approx. 290 ea. per color) as well as a total of 7 matching plastic cups. Dimensions of the bin $31.5 \times 23.5 \mathrm{~cm}$, cup $\emptyset 6 \mathrm{~cm}$, peg $\emptyset 1.8 \mathrm{~cm}$, height 1.5 cm . Warring. Not suitable for children under 3 years. Small parts. Choking risk.

