



## **Cosmic Education**

**according to**

**Maria Montessori**

## **Group 1**

1. The Number Rods
2. Sandpaper Numbers
3. Number Rods and Numbers
4. Spindle Box
5. Counters and Numbers

## Group 2: The Decimal System

1. Presentation of beads
2. Presentation of cards
3. Function
4. Formation of complex numbers, also called 'Fetching Game'
5. Simple addition
6. The Big Display or The Bird's Eye View
7. Carrying
8. Dynamic addition
9. Simple subtraction
10. Dynamic subtraction
11. Subtraction in stages
12. Simple multiplication
13. Dynamic multiplication
14. Simple division
15. Dynamic division
16. Long division
17. Stamp Game
18. Stamp Game: Simple addition
19. Stamp Game: Dynamic addition
20. Stamp Game: Simple subtraction
21. Stamp Game: Dynamic subtraction
22. Stamp Game: Simple multiplication
23. Stamp Game: Dynamic multiplication
24. Stamp Game: Simple division
25. Stamp Game: Dynamic division
26. Stamp Game: Long division
27. Fractions
28. Names of fractions
29. Symbols of fractions
30. Fraction equivalents
31. Fractions - The Ticket
32. Fractions Operations - addition
33. Fractions Operations - subtraction
34. Fractions Operations - multiplication
35. Fractions Operations - division

### **Group3: The Counting Group**

1. Short beads stair
2. Teen beads only
3. Teen Boards
4. Teen Boards with beads
5. Ten Boards
6. Ten Boards with beads and symbols
7. Linear counting the square chain of 100
8. Linear counting the cube chain of 1,000
9. Skip counting
10. Possibilities with beads
11. Possibilities with beads: Multiplication
12. Square Of Pythagoras

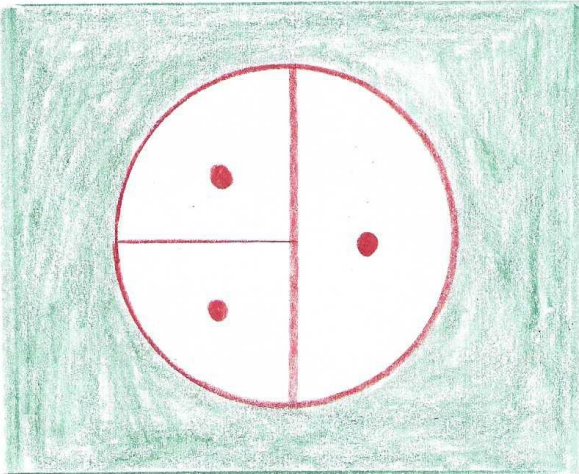
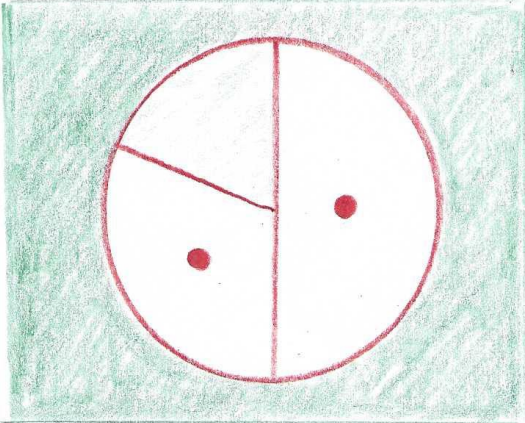
## Group 4: Tables

1. The positive snake
2. Addition strip board
3. Charts for the addition strip board
4. The negative snake
5. Negative strip board
6. Charts for the negative strip board
7. Multiplication tables
8. The multiplication board
9. Charts for the multiplication board
10. The division board
11. Charts for the division board

## **Group V - Abstraction**

1. Short Bead Frame
2. Short Bead Frame - Simple addition
3. Short Bead Frame - Dynamic addition
4. Short Bead Frame - Simple Subtraction
5. Short Bead Frame - Dynamic Subtraction
6. Short Bead Frame - Multiplication
7. Hierarchies
8. Long Bead Frame
9. The Dot Game
10. Short division with the test tubes
11. Long division with the test tubes

Sample:



## Fraction Equivalents

Take out one half of the family of halves. "Let's see what other fractions fit into here? Let's take  $\frac{1}{3}$  and see if it's fit? Does it fit? No. Let's take  $\frac{1}{4}$ . Does it fit? Yes. Let's take another  $\frac{1}{4}$ . Does it fit? Yes!! How many from the family of fourth fit in to the family of halves? 2, right!! Can we fit them on here?" Superimpose them both on to the red  $\frac{1}{2}$ . "Does it fit? Yes. 2 from the family of fourth fit in to the family of halves. "Let's try this?" Put the half in to the frame of the family of fourth. "Does it fit? Yes!!  $\frac{1}{2}$  is the same as  $\frac{2}{4}$ !!"

Continue trying to fit the other fractions in to  $\frac{1}{2}$ . " $\frac{1}{5}$ : no!  $\frac{1}{6}$ : yes. How many: 1, 2, 3. Will they superimpose on to the half? Yes!  $\frac{1}{7}$ : no.  $\frac{1}{8}$ : yes. How many from the eighth family will fit? 1, 2, 3, 4.  $\frac{4}{8}$  fit in to  $\frac{1}{2}$ !! Let's see if we can superimpose them? Yes!!  $\frac{1}{9}$ : no.  $\frac{1}{10}$ : yes. How many? 1, 2, 3, 4, 5.  $\frac{5}{10}$  is the same as  $\frac{1}{2}$ !!"

Make sure that the children try out all these different possibilities. Also, make sure that they do a lot of art work!! Have the children work with this lesson a lot!!

Control of error: In the material

Indirect aim: Mathematics

Direct aim: To give the children a sensorial impression of equivalents of fractions.

Age: 4.5 and up.