

# FUNCTIONAL MATHEMATICS

---

## Step by step process:

The educational needs of these children are varied, yet there are a set of basic methodology to learn concepts and skills depending on the needs of each student.

### Level-1

The current level of functioning has to be assessed, and depending on the skills they have mastered, one should proceed with the next step.

- Demonstrate number and number sense
- Develop an understanding of number meanings and relationships
- Demonstrate number concepts 0-9 ( for example, the child should be able to pick up 3 objects from a group of objects, when instructed to do so)
- Demonstrate concepts of none, more, less, and equal
- Understand the concept of age, when questioned about their age, they should be able to reveal their date of birth, using their fingers, their should be able to show their age or else pointing to the number in the chart or just point to their ID card.
- Read written numerals 0-9
- Count, read and/or write numbers to 100

### Level-2

- Understand and demonstrate one-to-one correspondence between objects in collections. For example if shown a number, the person should count and keep that many objects next to that number.
- Match groups having equal numbers of objects up to 10
- Using a model of sets up to 5 or 10, complete partial sets – Number bonds upto 10 ( for example, if we are given a set of objects say 2 or 3, then the child has to determine how many more or less to be added to make the group equal to 5 ) once they have mastered this level then they can proceed to the next group to teach upto 10 counting.
- Distributing the given items equally to the students present in the group. Say if given a set of 10 pencils and if they are asked to distribute one to each student, they should be able to perform it. The same activity can be practiced with different items and make it into a more meaningful activity also.
- Use manipulatives (concrete materials) to count, order, and group
- Count to 10 using concrete objects
- Count out requested number of objects up to 10 with an example
- Count out requested number of objects up to 10 without an example
- Match number of objects to number symbol
- Understand the concept of cardinal numbers and ordinal numbers. Once the number concepts are taught, then the ordinal position in terms of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> positions should also be demonstrated.

Using left to right progressions in groups of 5 and then group upto 10, the ordinal position can also be explained. (group a set of books, place the children in the class and then ask the child to indicate the 1<sup>st</sup> chair, 2<sup>nd</sup> chair and so on.

## Money Concept:

- Identify the various denominations of rupees, starting with ₹1, ₹5, ₹10, ₹20, ₹50 and ₹100.
- First recognition of the lower denomination coins and rupees upto ₹50 and how to use the money for purchasing the child's favourite items. One can use fake money bills or through some apps that deal with virtual money.
- Show the student some bill, with the price for 2 to 3 objects and ask them to place the appropriate amount equal to the bill.
- Simple word problems involving just addition and subtraction of one digit and two digit numbers upto ₹20 can also be worked out with the children.

## Measurement concept:

- Demonstrate understanding of measurement ( in terms of comparative size, when shown two lengths of rods, the person should be able to point correctly which one is longer than the other one)
- Use measurement in real-world situations
- Demonstrate understanding of more and less
- Match number name to a given quantity (e.g., get 3 apples at the Grocery store) as depicted through concrete or pictorial representation
- Demonstrate ability to use measurement tools.  
(for example teaching to measure things using 1 cup or a teaspoon)
- Tell or access time using an analog or digital, talking, or Braille clock
- Use time measurements to make decisions (e.g., set alarm clock, and set timer for cooking, use clock to follow a work schedule or determine if early or late for an appointment, estimate quantity of time needed to complete an activity such as getting ready for work, washing hair)
- Differentiate among the concepts of day, month, year, and date .
- Demonstrate understanding of calendars including concepts such as days, yesterday, today, tomorrow, weeks, months, and years (e.g., by marking special events, birthdays, work schedule, mark days off on calendar and determine how many days to a holiday, doctor's appointment etc.)
- Read and write the date in a particular way.

## Understanding of Patterns and Relationships:

- Compare and sort objects by their physical attributes
- Demonstrate an understanding of basic directional words (e.g., under, over, between, behind, through)
- Identify two-dimensional shapes
- Group objects as same/different.
- Using one-to-one correspondence, match by each characteristic of the following characteristics: shape, size, color, texture, weight, and/or length
- Arrange objects according to size (e.g., organize measuring cups or mixing bowls by size and the best toy for this is the nesting cups)

- Teaching them to group objects under various characteristics and attributes like hard or heavy, soft or tight, big or small and so on) learn to group objects under broad categories like tablets, food, clothing, make up accessories and so on.
- Teaching them through demonstration an understanding of daily activity schedule by following a sequence( e.g. Follow picture directions, visual schedules and planners)

### Functional Math Skills

#### **Some sample objectives:**

- 1) The child will be able to understand the time concept related to the school van. He would also understand that the morning school bus would arrive at 8.30 am for him to go to school.
- 2) Understand the concept of period breaks in the school and that whenever the bell rings, an hour has gone. The children can be given learning based activities to be practiced at home, where they also try to ring the bell for every hour of activity
- 3) The child will be able to use a calculator and understand the concept of summing up given a set of 2 or 3 numbers. It can be made more meaningful by asking the child to add the prices of some everyday commodity like packets of milk, biscuits etc.
- 4) Learning to count money and handling virtual money or fake money upto 100 rupees.