

The purpose of school education, especially at the Foundational Stage, is to provide learning opportunities that are suitable for enhancing students' physical, emotional and cognitive development. In order to provide learning opportunities, we must try to understand how children learn. How do they make meaning? Do they learn at the same pace and in the same ways? When children learn at different paces and in different ways, how should the teaching or the learning environment be? Having understood the need and the goal, it is essential to provide diverse strategies so that the learning environment is conducive to making connections and consequently, meaningful learning.

Any activity that we do, involves the regulation of thought or the cognitive process. For example, if a pre-schooler wants to make a string of beads, they will take the thread in one hand, hold the bead in the other and put the thread through the hole in the bead. When successful in this, they will confidently insert the next bead in a similar way. If the hole in the bead is small and does not let the thread pass through, they will eliminate that bead. Gradually, they will acquire selection and elimination skills. This understanding of a child's cognitive process helps us connect it to maths too.

Finding similarities and differences in maths plays a major role in building reasoning skills. Spotting similarities and differences is a core learning skill but is not given much importance in our teaching/textbooks. It is the basis of a lot of learning – in how we connect concepts.

In traditional textbooks, similarities and differences are taught with comparisons, such as tall/short, big/small, light/heavy etc. In supplementary books or children's magazines, these are in the form of 'spot the difference' games, which children enjoy doing. But there is a greater scope of learning this concept better that is missing in a non-interactive medium, like a textbook. In this article, I will focus on reinforcing this skill through activities that use several senses, like working with tactile materials, looking at colourful beads, selecting/eliminating

based on colours and arrangements, and so on.

In maths, we teach patterns using numbers, shapes etc., in primary class children. In Tamil Nadu, as part of *Ennum Ezhuththum* (numeracy and literacy) programme, the resource team (this writer is part of the team) created activities using materials that are available in the school/home environment.

Stringing beads activity

In the Tamil Nadu maths textbook (2017) of class I, there is an activity named, 'Making a string of beads'. The same activity is proposed here with a crucial difference to reinforce number sense, thereby strengthening the understanding of similarities and differences. Through this, we have tried to bring different strategies, through different aspects, in the same activity.

I conducted the following activity with class I children of Government Primary School, Sompura Gate, Bengaluru.

Objective

To strengthen the understanding of similarities and differences along with the following:

- To build eye-hand coordination
- To build fine motor skills
- To perceive differences in arrangements
- To communicate with peers
- To observe one's own work and compare it with others'

Materials required

Thread; beads/straws cut into small pieces; clay; notebook for rough work and colour pencils

Duration: 45 minutes

Activity phase 1 (individual)

Give a length of thread and a bowl of beads/straw pieces to each student.

Each student makes a string of beads/straw pieces. Each one's arrangement is different. Each one talks about their arrangements. They look at their peers' arrangements and talk about how theirs is similar or different from their own.

Activity phase 2 (in pairs)

Seat children in pairs.

Each child in the pair makes their own bead string, and it should be identical to their partner's.

Activity phase 3 (in pairs)

Assign roles (by turns) of Instructor and Follower.

A (Instructor) instructs B (Follower) to arrange the beads; A chooses the beads and their sequence; B has to follow as A says.

Then, B (Instructor) instructs A (Follower) in the same way but keeps in mind that the arrangement of beads is different. They talk about similarities and differences in the arrangement.

Activity phase 4

The children are given notebooks and coloured pencils.

They are asked to draw the bead mala that they have made. (This is representing their work non-verbally.)

Next, the teacher makes a string of beads and tilts it slightly and asks the children what will happen if she does not hold the lower end of the string. *What should I do to make sure that the beads don't fall out? Can you help me to stop the beads from falling?* She asks.

(If the children are not coming up with answers, the teacher can show a small lump of clay/dough and ask: *Will this help?*)

Relationship between number sense and this activity

This activity provides many learning strategies related to pre-number sense. We can see that the activity enables children to:

- Compare their own arrangement with others' arrangements and express similarities and differences
- Keenly observe each bead/piece of straw in the arrangement:
 - To figure out: Are the given number of objects enough to generate the pattern? Do we need more? How many more do we need?
 - To check and verify if the arrangement made by oneself is correct. Does anything need to be changed? If so, what?
- To think and discuss with others, to make others understand: What should be inserted first? What should be inserted next?

When we get children to pause and think about what they are doing, what others are doing or how they can do things differently, the activity gains pedagogic depth. Further, similarities and differences are central to mathematical thinking and carry greater value in developing pre-number sense than mere counting. Colour attracts children and provides them with sensory nourishment, the activity uses this for a mathematical purpose by encouraging colour combinations.

The more we engage children's senses and their attention in activity, and at the same time, provide opportunities for them to observe, notice, compare, express and act accordingly, the better is learning.

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Krithika is a member of Azim Premji Foundation based in Bengaluru. She is deeply interested in primary maths education. She was part of the team that revamped the syllabus and textbooks for primary maths by the Tamil Nadu SCERT. She is currently supporting the *Ennum Ezhuththum* (numeracy and literacy) programme in Tamil Nadu. She may be contacted at krithika@apu.edu.in