

Reflection 1

Mrs. Seema's class seems to have sufficient space and a good pupil teacher ratio (30:1). However, from the observation, there seems to be no TLMs in the class. Since it is a lower grade (Class 1), and children are getting introduced to math operations, using various TLMs might be effective in helping children visualize and develop number sense. The children have learnt single digit subtraction and know that to subtract something is to *take away*. They also know the symbol of subtraction : *minus*. The teacher calls the representation of numbers in subtraction as methods : *horizontal* (65-32) and *vertical* ('numbers will be up and down'). One can ask what number will be written up and what will be written down? It is important for children to understand that these are just representations of numbers in subtraction and not methods of subtraction.

Teacher has taught number sense in the form of bundling of tens. In the *horizontal method* 65 is represented as 6 groups of 10 lines and 5 lines. When subtracting, the teacher starts from the tens place, removing the bundles of tens first and then subtracts the units place by crossing the lines. However, while saying that the representation (drawing and grouping the lines) holds good for the *vertical method* as well, the teacher starts subtracting from the one's place and instructs children to always start subtracting from one's place, and to follow the second (*vertical*) method without providing the reasoning.

Children should be given a chance to realize that while bundling of tens and drawing lines to subtract is also correct, it would be time consuming and decide for themselves that subtracting using symbols should be preferred. Teacher could have also built on the bundling of ten's representation to explain 65-32 in the symbolic method. The teacher says 5-2 and 6-3. she could have said 2 ones are being subtracted from 5 ones and 3 tens are subtracted from 6 tens. Else some children might see the two digit numbers as single digits placed adjacent to each other without the understanding of the position or units. This would have helped children visualize the bundling of tens representation mentally while subtracting symbolically. Split tens method could also have been introduced here instead of following the *vertical* algorithm to subtract.

Children understand abstract concepts of numbers as they use fingers to count, which is a level up from counting using actual objects. Children also use *counting down to* strategy to subtract when they count down from 6 to 2 and 6 to 3 in the 76-32 example. Teacher expects the children to do only *backward* counting as subtraction is associated with taking away hence, moving backwards. There is a risk of children understanding subtraction as a ritual of counting backwards and failing to discover different approaches. It would be an enriching experience for children if they are asked to come up with ways to take away a number from another number and discuss it in the class. Then, the different approaches that children might come up with (counting out, counting back from, count up, using known facts and derived facts) can be shared with the class and children can see that all the approaches give the same answer. Children can also discover when to use which approach instead of following one approach. This will help in strengthening the number facts and discovering inverse operations.

When a student starts subtracting from the ten's place (84-04), the teacher just asks him to start from the one's place. The student might think he got the same answer (80) while starting the subtraction from the ten's place. Teacher should have addressed this approach in

the class as it is one of the common approaches children take, and explain, while it is possible to start subtracting from the tens place (as she did in the bundling of tens representation) it will become messy while doing it symbolically.

When the aim of teaching math is to help children develop mathematical reasoning, questioning, presenting arguments and justifying them, just the instructional method of teaching in this particular class is not conducive. Children are asked to follow the procedures given by the teacher, practice and drill is more emphasized as children are asked to copy down the similar type of problems to solve. Given that it is a mixed group class that is spacious, children could be made to sit in groups to solve the problems, present their approaches and justify their answers.

The teacher can then address the misconceptions or mistakes that might arise and consolidate the learning. It is also important to test if children are comfortable with single digit subtraction before starting double digit subtraction. If children were also made to realize the number triples when single digit subtraction was taught it would help in building other approaches of subtraction and also help children realize reversing addition gives subtraction.

Introducing subtraction(single or multi-digit) should be embedded in a meaningful context instead of just using mathematical representation. Children should be encouraged to solve problems rather than following a set of procedures given by the teacher.

References

Anghileri, J. (2006). Teaching number sense. Continuum International Publishing Group
Fuson, K. (2003) Developing mathematical power in whole number operations. In J. Kilpatrick,

W.G. Martin and D. Schifter (Eds.) A research companion to Principles and Standards for school mathematics. NCTM

Questions to ponder

- What do you understand to be the context in which this entry/ set of entries has been written?
- Does it describe an 'observation'? Does it contain any 'interpretation'? Is there any feeling of 'judgment' expressed? Does the entry express emotions being experienced by the writer?
- Does the writer draw on any assumptions, theories or frameworks in the entry? Is there any indication of trying to make sense of an experience in light of these?
- Does it express or indicate a problem or dilemma being faced by the writer? Is there any indication of reflection on the situation, or an attempt to solve the problem?
- Is there any reflection on oneself evident in the entry?