Exploring Number Addition with Teachers

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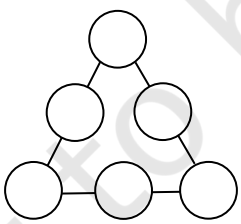
Exploration is one of the key activities in a classroom, which can generate interest and initiate learning about particular concepts or theme. There are many questions in the minds of teachers, who are willing to initiate their students into exploration. Some of the questions are: "How does one create an exploration activity?", "what is an exploration activity?", and "when and how does one know where to stop?"

To give primary teachers, teaching Class I and II mathematics, an experience of exploration about numbers and number operations, it was planned to give them the following exploration assignment:



In this picture, six circles have to be placed in such a way that each side of the triangle adds up to the same number (9). For a trial, this assignment with the picture on a sheet of paper was given to one teacher to solve. It was being observed how the teacher was exploring or making attempts to solve it. The teacher first wrote some numbers in the circles and tried to add them but it did not work. Then, she erased all the numbers and started writing the numbers again. After two-three attempts, she looked around and said, "It looks a simple challenge but is difficult." After two–three more such attempts, she was able to do it and finished with a smile.

Observing the person doing the exploration task made one think: "What can we do to make this exploration task interesting? How do we introduce the fun and challenge element into this task? Is it possible to move the numbers to avoid writing and erasing?"

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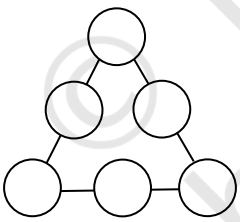
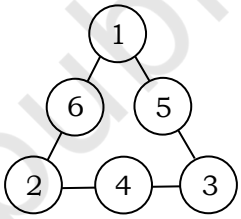
The last question triggered further questions. "How can one make the numbers movable to introduce fun element into the task?" There were many suggestions about it. Finally, circular plastic counters (which are used in playing ludo or board games) were chosen. It was also decided that each participant teacher would create his/her own number counters for the task by writing the number counter for the task and write from numbers 1 to 9 on the counters. Afterwards, it was also worked out how the activities for exploration would be taken up further.

On the scheduled day, an the interaction with the teachers of classes I and II started. Each teacher was provided with 10 plastic counters and asked to write numbers 1 to 9 on them (leaving one counter blank for later use). Then, the picture as shown below was drawn on the board and the teacher participants were asked to draw the same on a sheet of paper.



Once this was done, the group was ready for exploration. The exploration task was announced — place the numbers (written on the counters) in such a way on this figure that the sum of each side is 9. A remark was overheard "Oh! It seems easy!" But when each one started moving around the counters (with numbers written on them), the fun began. It was observed that most of the teachers were trying different positions of numbers and adding them to check whether the sum was 9 or not. Remarks, like "does this task have a solution?", were also heard. Interestingly, not only the participant teachers were exploring and making their own strategies but also commenting on the strategies of other participants. However, some teachers were able to find a solution. But there were some who were still trying. The discussion on the solution started with one teacher writing the solution on the board.



In response to the question "how did you get to the solutions? Please recall". The teachers came up with their exploration efforts and explained different permutation combination they had tried to get the solution. It was interesting to note their enthusiasm for exploration. It was obvious that they were ready for more exploration and the next assignment was — "can you rearrange these numbers in such a way that sum of each side is 11? The exploration about single-digit numbers and their addition had begun in the real sense.

Later, the teachers expressed that they had understood what exploration was all about. The fun, challenge and joy of discovery that they had experienced enhanced their learning and insight about single-digit addition.

I request the readers to involve themselves into exploration activity and try to find out how to arrange numbers 1 to 6 in the figure given in the article in such a manner so that the sum of numbers on each side is 12.

Do write to us about your experiences of exploration about numbers.