

## M&S CAN BE FUN

TEACHER	Dr. Dhananjay Pandey
SCHOOL	Government Multipurpose Higher Sec School, Dayalbandh, near Gandhi puita, Balaspur Chhattisgarh – 495001
PHONE NUMBER	9131-4130-12/9691-1655-51
E-MAIL	ohm5012@gmail.com



Scan QR-code  
to watch video



Dr. Dhananjay Pandey, MSc (Mathematics), MA (English, History), PGDCA, PGDCPA, PhD has completed 26 years as government school teacher of math and science in 9 to 12 standards.

When Dr. Pandey found children facing difficulties in mathematics and science he approached a friend in the Institute of Advanced Studies in Education who advised him to counsel and listen to them quietly to create an atmosphere free of fear. He followed the advice and began to have one-hour discussions with the students every day after school hours. He would even eat with them during lunch. The students' fear gradually lessened and they began to ask him questions freely about anything they didn't understand. Their problems were very basic and fundamental. Dr. Pandey decided to use a few tools and begin with the basics. He also felt the problem was more acute at the lower levels, that is, in classes 6 to 8. He taught students using a number of waste articles thrown away by people and the tools available from the math-science kit. The key idea was to explain the principles behind the working of things. Thus, he developed a Geo Board to teach algebra.



Children doing scientific experiment

### Teaching aid for algebra

This tool was easy to use to teach class 6 to 10 students, covering Arithmetic, Algebra Geometry, and Mensuration. The board is just a rectangular frame of wood with nails at equal distances, and rubber bands and threads. It served as an activity-based tool to teach shapes and measurement.

The board involves the use of the following steps:

1. Test basic knowledge of parallel lines such as definition, corresponding angles, alternating angles, linear pairs, sum of interior angles, and opposite angles in written and oral form; 3 working days with Math book, geo-board: written and oral.
2. After the test, identify the students who are not interested in the subject. Two working days, written and oral test, results, interview with students and teachers.
3. Find out why students dislike math. Working days – 2, student test papers and oral interviews, interview and test papers with students and teachers.



Exhibition of scientific model in Rashtrapati Bhavan

4. Creating interest in mathematics in students. Working days – 30.  
(1) Conducting various activities related to mathematics using Geo-board to check the theoretical truth. (2) Organizing math quizzes: To confirm the veracity of algebraic expressions, diagrams, parallel lines, and field theorems and questions by students through Geo-board.

The above should be supplemented with homework and practice in the classroom, and the use of questionnaires to test understanding.

The results were good, with the marks obtained by the students increasing over time. Dr. Pandey then thought of converting the Geo Board into an LED-based tool with sensors and microphones. He decided to take part in the test for NITI Aayog's Atal Tinkering Lab, and emerged as one of the top-10 participants after the interview round. With the funding now available, a tinkering lab was set up in 2016. Students of other schools who were interested in mathematical and scientific activities were also welcomed. Villagers and donors started donating items like TV, laptops, and other small and big machines for the lab. The students often work from 8 am to 10 pm in the lab. So far 12 students have got internships in MIT and IBM and 6 students have been given free admission in Laxmichand Institute of Technology, Bilaspur, All their tuition fees are borne by the institute. In addition, the students are also given a stipend of Rs 3200 per month. NITI Ayog has



Lecture in Atal Tinkering Lab

published the school's work. The students have also created a robot in the lab to assist in treating Covid-19 patients.

Dr. Pandey has represented Chhattisgarh in Western India Science Fair, Nehru Science Centre, Worli Mumbai many times. He has represented India in Avishkar Innovative Track in Dubai and his project was declared the best in the competition. The work has been presented to President of Russia, Shri Vladimir Putin and Prime Minister of India, Shri Narendra Modi, and to President Shri Ramnath Kovind at Rashtrapati Bhavan New Delhi.



#### QUESTIONS FOR TEACHERS

1. What activities must be done to teach science interestingly?
2. What are the things to look out for when conducting a math activity?
3. How should the connection between math and science be explained to children?

#### QUESTIONS FOR TRAINEES

1. What activities should be done to raise interest in the subject of Mathematics among the students?
2. What are the things to keep in mind when conducting activities that combine math and science subjects?
3. What activities should be done for revision ?