MATH AND SCIENCE TOYS FOR FUN LEARNING

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Shri Jitendra Panchotia has been a primary school teacher since 1998. He has done SSC, PTC. After joining duty, he completed graduation in Gujarati and History.

For about 15 years he has been teaching Mathematics and Science in Classes 6, 7 and 8. He has worked on different educational tools and educational toys to make Science and Maths subject easy and interesting for the children. He is currently teaching Classes 1 and 2.

While teaching class 6 to 8 students he found that they found it difficult to grasp subjects like maths and science. He realised that the students of Std. 6 to 8 find it difficult to understand the basic concepts of Science and Mathematics during class teaching which increased their disengagement with the subject. He came up with this innovative experiment to use educational tools to generate interest for these subjects. Shri Jitendra had seen these tools and toys in the various educational fairs he had visited over the time. Further, he had also attended a training workshop on scientific toys organized by DIET Rajkot in 2009, which prompted him to put his knowledge to practical use.

He began by organizing a low-cost three-day workshop for about 140 students from classes 5–7. The workshop met with success and became a bi-yearly affair. In these workshops, he taught students how to make scientific toys. The students responded well and made around 80 Science/Mathematics toys which were put to use in the classroom.

And as the workshops progressed more toys were made and used as teaching resources. Shri Jitendra then came up with the idea of a mobile kit, a set of four bags which contained the materials to make toys. Besides, these kits also housed the toys that students made and could be carried from one class to the other for use as teaching resources. The children were greatly motivated by the activity and would bring material from home or collect from surroundings to put to creative use.

Shri Panchotia had learnt how to make videos at the DIET Rajkot, training event and put his

Box for doing aditions

Science Toy Making Teaching Video

List of Scientific and Mathematical toys created by students

- Magical pipe
- Airboat
- Hovercraft
- Berlin fountain
- Obedient ball
- The principle of submarines
- Light box
- Magic box
- Inflate the balloon
- Waterlogging
- Centrifugal force
- Construct shapes
- The magic stick
- The reality of sum
- Throw dice and calculate
- Slope climbing ball
- Pearls climbing the slope
- Air jack
- Model of leverage
- Clapping bird
- Coloured fountain
- Bottle rotation
- Potential energy toy
- Magical ball
- Whirlpool in the bottle
- How to inflate a balloon?
- Number constructor
- Find the place value
- Construction of angle
- The math of the period
- Wheelbarrow
- Rotating object
- Butterflies in the mirror
- Parrots in a cage
- Slope climbing monkey
- A simple stethoscope
- Let's see the air
- Moving ball
- Ball moving due to air pressure
- Magic ball
- Shape of the lungs
- Burning candle
- Moving bus
- Slope climbing toy
- Bending strip
- Magnifying glass of the bulb
- Vibgyor
- Let's measure
- Air pressure fountain
- Diver
- Blow the chalk
- Pinhole camera
- Rocking doll
- Flying rope
- What do you see?
- Jump
- Let's inflate a balloon
- Measure 1 litre
- Flying bullet
- Centrifugal pearls
- Illusions
- Electrical conductor non-conductor
- Hydroelectricity
- Magical glasses
- Plain Jack
- Shape of the ear
- Air magnet
- Direction indicator
- Straw whistle
- Simple plane
- Floating rope
- Windmill model
- Flute
- Numerical wheel
- Mobile projector
- Simple filter
- Let's play
- Numerology while playing
- Jal Tarang
- Gravitational point bird
- Light travels in a straight line
- C- shaped periscope
- Paper cracker
- The principle of the motor
- Magical car
- Conversion of potential energy into kinetic energy
- Let's count
- Bending pencil
- Maglev train
- Centrifugal fountain
- Model of a flower
- Cup telephone
- Level from test-tube
- Magical spin
- Magical Rampuri Knife
- Simple pump
- Model of generator
- Wave model

knowledge to use by making videos and uploading them on the YouTube channel. His channel was titled, "Panchotiya Jitendra educational video" and children from other schools also got to benefit from the videos.

To further improve his innovations, Shri Panchotia regularly sought feedback from the students. For example, the first 20 minutes of the workshop was spent on a pre-test; later on post-tests were done to assess the improvement. The children showed increased interest in science and were able to explain several associated concepts. Their own creativity also came to the fore as they came up and implemented constructive ideas on their own. There was also a marked improvement in the attendance after implementation. Teaching also became simple and more effective.

These educational toys were also used to train other teachers. Students have also taken the responsibility to record videos when these toys are made and upload them on YouTube for the benefit of other students who also want to learn. Gradually word spread and now teachers and students belonging to other schools are also benefiting from these videos.

Shri Panchotia has been honoured with the Chitrakoot Award in 2017, the Sandipani Award, the state government's best teacher award, and some others

Children demonstrating graphs

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QUESTIONS FOR TEACHERS

1. What should be done to make scientific toys made for less money?
2. What are the things to be taught while making math science toys for children?
3. What activities can be done for children to increase their interest in mathematics and science?

QUESTIONS FOR TRAINEES

1. What activities can be done to develop creative power in children?
2. How do you evaluate how much children have been able to understand the subject matter through a scientific toy?
3. What kind of homework should be given to children to be creative in mathematics and science?