

BIOLOGY DGHD MICROSCOPE

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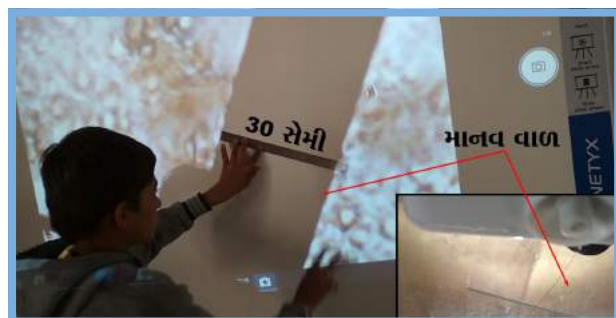


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Shri Chiragbhai Sachaniya joined as a Mathematics and Science teacher, Class 6 to 8 in Shri Golan Sherdi Primary School of Khambhalia taluka of Devbhumi Dwarka district in July 2010. He was transferred to Srinagar Primary School No. 32 in August 2013. Education qualification – B.sc, B.ed with chemistry.

At the Golan School in 2010, there were 70 students (Class 1-8) and three teachers. The school was in a very backward area. The parents were all daily wage workers, employed as labourers. Out of the 35 students in the upper primary section, Shri Sachaniya found about half did not have any foundations in science and mathematics. He wanted to convey concepts in an easily understandable format, and so decided to use flashcards. He began experimenting with animated videos, flashcards, and various tools. In order to make it easier for the students to experiment themselves, the flashcards were organized according to (1) list of tools, (2) intermediate process, and (3) results and outcomes. In 2011-12, he and his fellow teachers used laptops or mobile phones to show various animation videos. They were preparing printouts of flashcards from a nearby city. With these efforts, the students finally began to show some interest. However, three teachers having to share one laptop was a problem, and so one computer was borrowed from a nearby school.



Using a microscope in the classroom

At Srinagar Primary School, there were 140 students in Class 1-8, and of these, 75 students were in Class 6 to 8; there were eight teachers. The school had an LED TV, 11 computers, DTH dishes, etc. for digital education. Shri Sachaniya started to use these along with animation videos and the flashcards which he already had. He used to identify relevant material from the internet at home and use it in school. Some experiments could not be undertaken due to insufficient equipment in the laboratory. Hence, he prepared a list of all tools required and tried to develop low-cost alternatives since the school grant was limited. For instance, a funnel that cost Rs. 250 in the market was made using plastic bottles in the school itself. His co-teachers supported him in



Making of a digital microscope

this activity.

In February 2014, with the school grant, an LED projector was bought and this was useful for digital education, especially for Class 6-8. At the same time, some reference literature was provided by the government and other agencies such as the Rotary Club. A dongle was bought to bring in internet connectivity.

Given the resource constraints, Shri Sachaniya was forced to innovate. For example, for the lessons on the cell, microscopes were



DGHD Microscope

needed. A microscope cost around Rs.2500 but he decided to construct a digital microscope (a digital camera connected to a monitor). Learning from the internet, he collected the required material spending only about Rs. 600: an old webcam, old DVD drive, a wooden block, transparent plastic stick, LED light, glue, USB cable, and materials to prepare slides. The main advantage was that all the students could see the magnified image simultaneously when the image was projected onto a screen.

With these methods, Shri Sachaniya tried to make education interesting. He also made the assessment more engaging. Methods of answering through games and group exercises were adopted. In 2014-15, he introduced online

quizzes, Plicker, online games, for evaluation. In addition, many free apps and videos available on Kahoot, Playstore, YouTube, etc. were also used.

The students enjoyed learning through different methods and the results obtained after the assessment showed that they were writing their answers well, and were also able to answer orally. The digital microscope was especially helpful in sparking interest in biology. Other teachers learned how to make low-cost digital microscopes for their schools.

The school participated in the Educational Innovation Fair organized at the district and state levels by IIMA and GCERT.

Shri Sachaniya has been recognized for his work with many awards such as the State Level Innovation Fair Certificates in 2016-17 and 2017-18; participation in the Fourth International Conference on Creativity and Innovation at/for/from/with Grassroots (ICCIG 4); and a talented teacher award from the Government of Gujarat.

ACADEMIC YEAR	ACTIVITY	DISTRICT/STATE LEVEL
2016-17	The fraternity of mathematics-science through technology	State-level
2017-18	Digital HD microscope	State-level



QUESTIONS FOR TEACHERS

1. What activities can children engage with technology?
2. What activities should be done to make the children more interested in mathematics and science?
3. If you see such a problem in your classroom, what steps will you take to prevent it?

QUESTIONS FOR TRAINEES

1. Where are the teaching approaches used to teach subjects in mathematics to children?
2. State three ways to teach kids math-science subjects.
3. What homework should be given to help children become more active in mathematics and science?