

Beyond the Classroom: The Makers Lab on Wheels – STEM Outreach Journey

A collaborative initiative by Infosys Foundation and Nanritam's Education For All (EFA) program

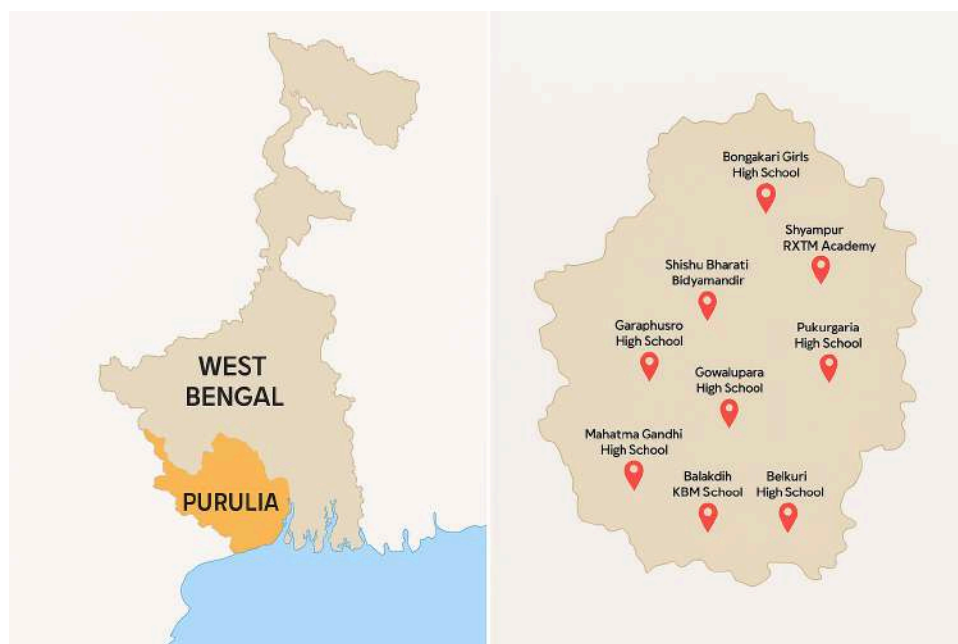
Impact Overview (Feb–Jul 2025)

The journey of the **STEM Lab on Wheels** began on **February 10, 2025**, with its very first outreach session at **Bongabari Girls High School**

in Purulia. What started as an experiment in taking technology directly to rural classrooms soon grew into a full-fledged movement of innovation and curiosity across the district.

Between **February and July 2025**, the mobile STEM lab reached a total of **18 Government schools**, directly benefiting more than **2,800 students**. Of these, around **900–1,000 were girls**, supported through special

engagement with all-girls institutions such as Bongabari Girls High School, Govt. Girls High School (Purulia), Santamayee Girls High School, and Nazrul Balika Vidyapith. Boys, primarily from Purulia Zilla School and various co-educational institutions, made up the larger share of participants (~1,600–1,800). The program placed strong emphasis on **gender inclusion**, giving both girls and boys equal opportunity to experiment with coding, automation, and electronics. Teachers noted how girls displayed rising confidence in programming and circuit design, while boys showed equal enthusiasm in collaborative troubleshooting and project-building.



The calendar also reflected local realities: **April and May were non-operational months** due to **extreme summer heat and school vacations** in West Bengal. This natural pause gave the team time to regroup and design more advanced activities, which were rolled out from June onward. The later sessions introduced **IoT-based learning and agriculture-linked projects**, making STEM more relevant to students' everyday lives.

Introduction

The STEM Lab on Wheels initiative, spearheaded by Infosys Foundation in collaboration with Nanritam's Education For All (EFA) program, is redefining how students in rural West Bengal engage with science and technology. By transforming a mobile van into a fully functional makers' lab, the program delivers microcontrollers, sensors, automation kits, and other digital tools directly to schools, bringing world-class STEM experiences to students' doorsteps.

Each session is facilitated by trained educators who not only introduce technical skills but also mentor students in critical thinking, creativity, and collaborative problem-solving. The program ensures that the digital divide narrows while local communities begin to see tangible applications of modern STEM learning in agriculture, transportation,



and energy—sectors deeply relevant to their daily lives.

Phase 1 – Launch and Early Outreach (February 2025)

1. Bongabari Girls High School (Purulia-I block, Feb 10–12)

Nearly 192 students from Classes 9 and 10 explored the basics of microcontroller programming. They began with LED blinking and advanced to designing traffic light system models. Teachers were deeply appreciative of how seamlessly theoretical knowledge from physics was linked with tangible outcomes, boosting students' motivation to experiment beyond the classroom.

2. Shishu Bharati Bidyamandir (Manbazar-I block, Feb 13–14)

At this school, 124 students engaged in LED circuits and smart automation projects. The hands-on nature of the workshop allowed learners to think like problem solvers. Teachers observed that even students with little prior exposure to electronics gained confidence in tackling new challenges and asking probing questions about real-world applications.



3. Malti Shyamnagar High School (Balarampur block, Feb 17–21)

Close to 195 students immersed themselves in microcontroller-based traffic light simulations and automation experiments. The interactive nature of the sessions encouraged lively discussions, with students posing insightful questions that reflected a deep curiosity about how technology could be adapted to solve local challenges in transportation and energy.

Phase 2 – Expanded Outreach (Feb–Mar 2025)

4. Garaphusro High School (Feb 24)

This smaller group of 60 students had the advantage of more personalized attention. They worked on LED blinking, microcontrollers, and automation experiments. Teachers highlighted that the smaller batch size allowed for more in-depth mentoring, enabling even shy students to confidently test their circuits and explain their working models.



5. **Gowalapara High School (Feb 25)**

With 120 students, this session focused on breadboard circuit building, traffic lights, and virtual simulations using Tinkercad. Students also registered on Infosys Springboard to continue their learning digitally. Teachers noted a marked improvement in practical skills, particularly in applying classroom physics knowledge to build functioning circuits.

6. **Pukurgaria High School (Feb 27–28)**

A large cohort of 255 students engaged in building traffic light models and smart doorbells. The activities required teamwork and troubleshooting, and students quickly developed problem-solving strategies. Teachers observed that the collaborative environment nurtured both leadership and technical skills, as students helped one another refine their models.

7. **Mahatma Gandhi High School (Mar 3)**

Here, 180 students were introduced to sensor automation and traffic systems. The demonstrations sparked conversations about career opportunities in engineering and technology.

Teachers reported that the students not only grasped the technical aspects but also began to imagine themselves pursuing STEM pathways in higher education.

8. **Balakdih KBM High School (Mar 5)**

At this school, 243 students completed LED blinking and circuit projects. Faculty members praised the high level of excitement and focus among the participants, with many students voluntarily staying back to test variations of their projects, showing sustained interest in experimentation.

9. **Belkuri High School (Mar 7)**

For 138 students, programming traffic light systems was the highlight. By linking coding with physical automation, learners experienced the satisfaction of seeing code produce real-world results. Teachers emphasized how the session made abstract programming concepts more concrete and engaging.

10. **Shyampur RKTm Academy (Mar 10)**

The 138 students here engaged deeply with automation models and programming exercises. Teachers observed a significant rise in analytical



thinking, with students not only replicating given models but also proposing their own variations, demonstrating early signs of innovation.

11. Manguria High School (Mar 12)

Around 119 students participated in automation system projects. Their creativity was on full display as groups came up with alternative designs for everyday challenges. Teachers noted that many students expressed a newfound interest in exploring science fairs and competitions.



Phase 3 – Continued Journey (June 2025)

12. Purulia Zilla School (June 4, 6, 9, 10)

Across multiple days, small groups of 26–69 students delved into LED blinking, automatic street lighting, and energy conversion projects. Teachers described the students' performance as "very good," reflecting both mastery of the concepts and enthusiasm to apply them in practical situations.

13. Govt. Girls High School (Purulia, June 16–25)

With repeated sessions for 30–50 students at a time, participants worked on smart doorbells, energy conversion, and street lighting. The multiple visits allowed for reinforcement of concepts, helping students build confidence. Teachers emphasized that these sessions supported exam preparation while simultaneously broadening practical exposure.



Phase 4 – Broadening Horizons (July 2025)

14. Filix School of Education (Barandanga, June 27–28)

Students at Filix engaged with railway gate automation, traffic lights, and energy conversion systems. Teachers were particularly impressed by the focus on safety innovations, noting how students could relate automation directly to their everyday concerns of road and rail safety.

15. New Holy Angel's Public School (Rupnarayanpur, June 30, July 2 & 4)

Students explored traffic automation, smart doorbells, and



energy systems. A notable feature of these sessions was the increased participation of girls, with faculty appreciating the inclusive approach that encouraged all learners to contribute equally to project work.

16. Santamayee Girls High School (Purulia, July 4, 8–10)

This all-girls school saw enthusiastic engagement with Ohm's Law experiments, LED customization, and energy conversion. Students coded unique LED patterns and demonstrated ownership of their learning. Teachers remarked that the sessions strengthened both conceptual clarity and technical creativity.

17. Purulia Netaji Vidyapith (July 11–19)

In daily sessions with 50–80 students, projects extended into IoT applications, including smart wipers, app-controlled cars, and energy-efficient lighting. Faculty were particularly impressed with how students integrated IoT concepts into their models, signaling an advanced level of problem-solving.

18. Purulia Nazrul Balika Vidyapith (July 21–29)

The sessions at this school focused on agricultural relevance, with students building smart irrigation systems, app-controlled cars, and customized LED lighting. Teachers noted that connecting technology to farming—a familiar context—greatly increased engagement and gave students a sense of how innovation could directly benefit their communities.

Reflections & Impact



- Reach: Over 2,435 students and 100+ teachers across more than 15 schools benefited between February and July 2025.

Skill Development: Students demonstrated measurable growth in coding, troubleshooting, collaboration, and creative design.

Curriculum Integration: Teachers praised the alignment with the physics and mathematics syllabus, ensuring sessions supported academic learning.

- Innovation & Community Relevance: Projects progressed from simple LED circuits to complex IoT systems, with direct links to agriculture, energy, and transportation—key aspects of rural life.