

# NEWSLETTER

ROBOT & ROBOTICS



## JM INTERNATIONAL SCHOOL, DWARKA, DELHI

### SUMMARY



About Robotics



First Robot



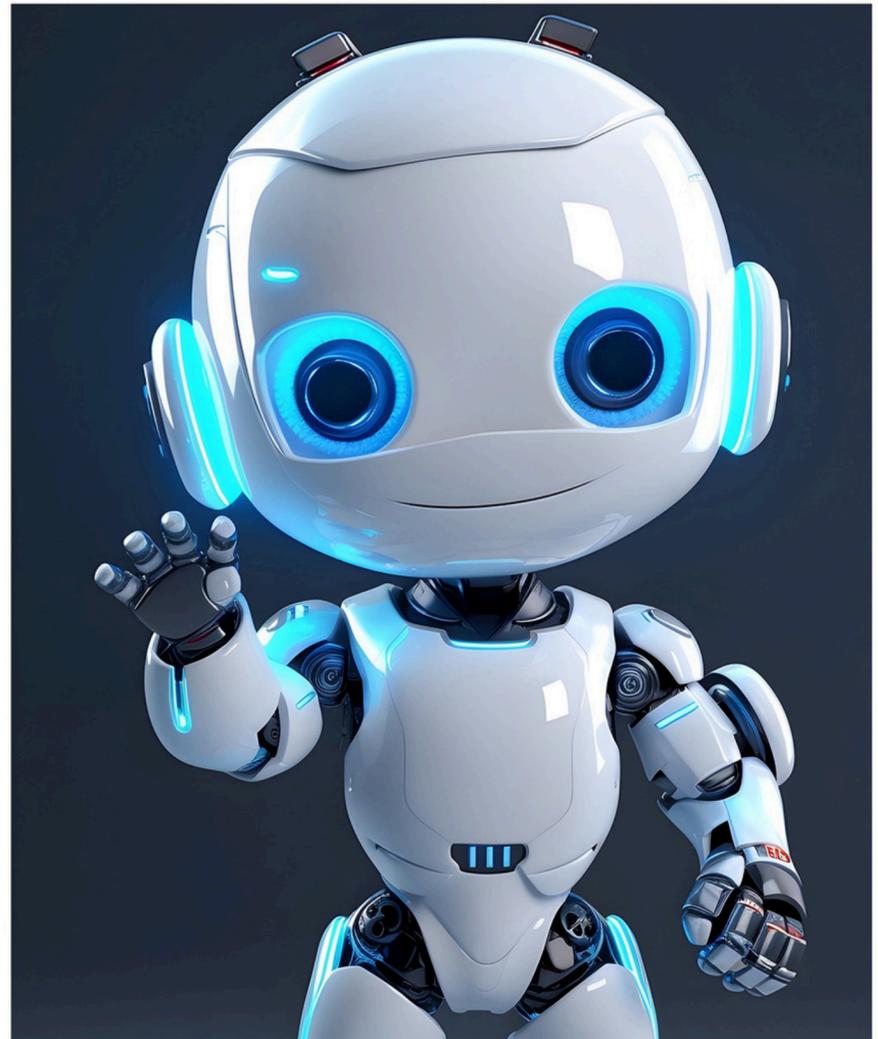
Utilities & Application of Robot



Some Advance Robot

# WHAT IS ROBOT ?

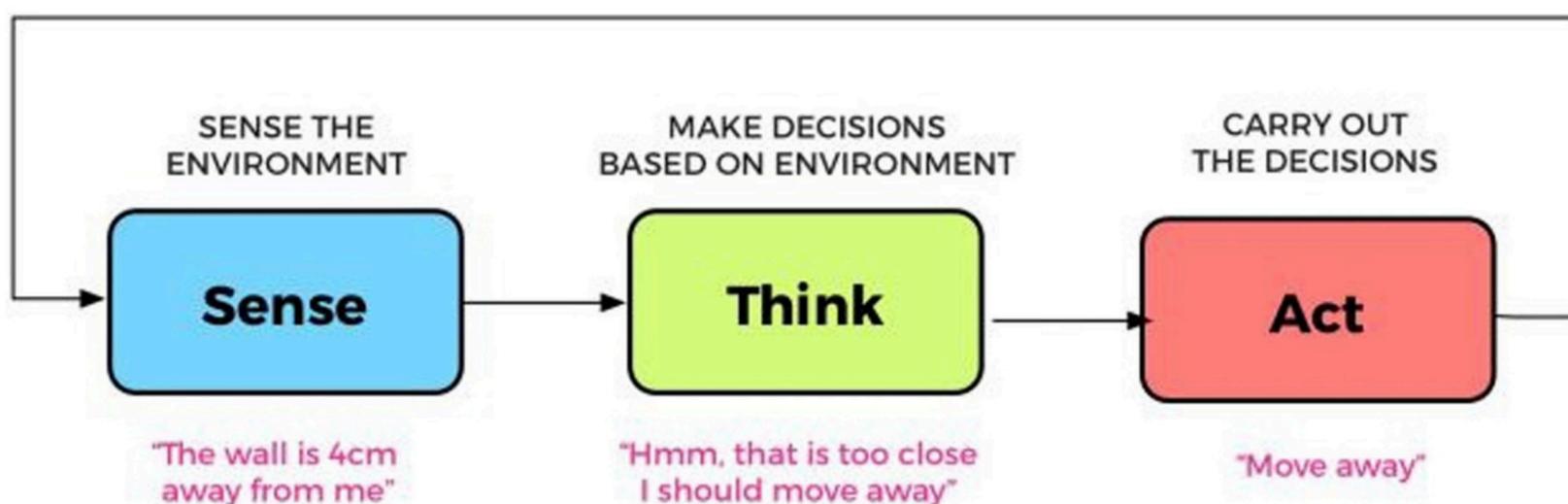
A robot is a mechanical or virtual artificial agent designed to perform tasks autonomously or semi autonomously, typically with programmable actions. It can be a physical machine composed of various components, such as sensors, actuators, processors, and power sources, or it can exist purely as software running on a computer system. Robots are built to interact with their environment and carry out specific tasks, often with greater precision, speed, and efficiency than humans.



Robots can be found in a wide range of applications and industries, including manufacturing, healthcare, space exploration, transportation, agriculture, and entertainment. They can take on various forms, from humanoid robots that resemble humans in appearance and movement to specialized machines designed for specific tasks, such as robotic arms in assembly lines or autonomous drones for aerial surveillance.

Advancements in robotics have led to the development of more sophisticated and intelligent robots capable of adapting to changing circumstances, learning from their experiences, and interacting with humans in more natural ways. These robots often incorporate AI (Artificial Intelligence) techniques, including machine learning and computer vision, to enhance their capabilities and decision-making.

## ROBOT OPERATION (SENSE › THINK › ACT)



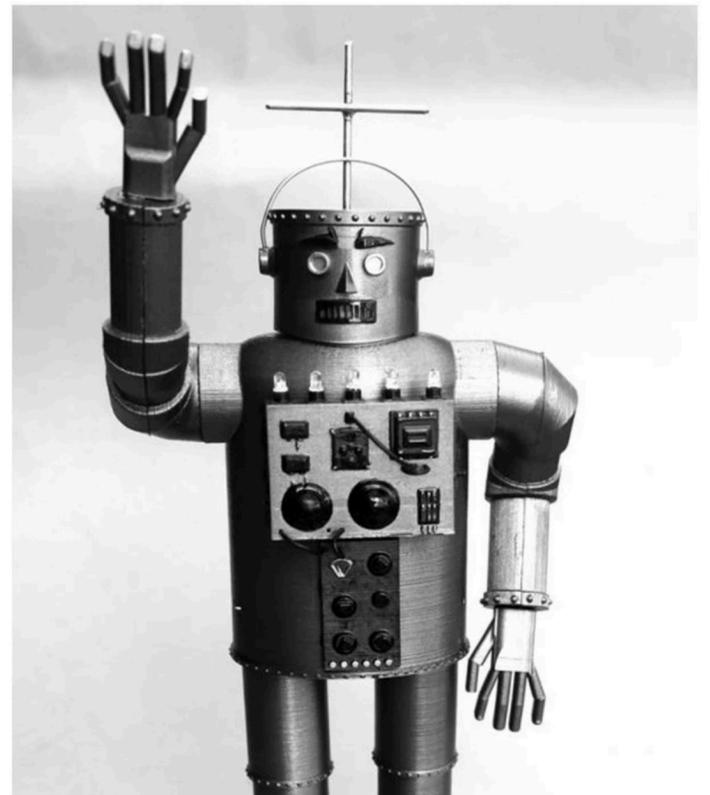
## ABOUT ROBOTICS

Robotics is the interdisciplinary field that encompasses the design, development, operation and study of robots. It combines principles from various disciplines such as computer science, engineering (mechanical, electrical and software), mathematics and physics to create intelligent machines capable of performing tasks autonomously or with human guidance.



## FIRST ROBOT

Unimate was an industrial robot designed to perform repetitive tasks on an assembly line. It consisted of a mechanical arm that could be programmed to perform various actions, such as welding, lifting, and stacking objects. Unimate was first installed at the General Motors plant in New Jersey, United States, in 1961. Its introduction revolutionized the manufacturing industry and paved the way for the widespread use of industrial robots.



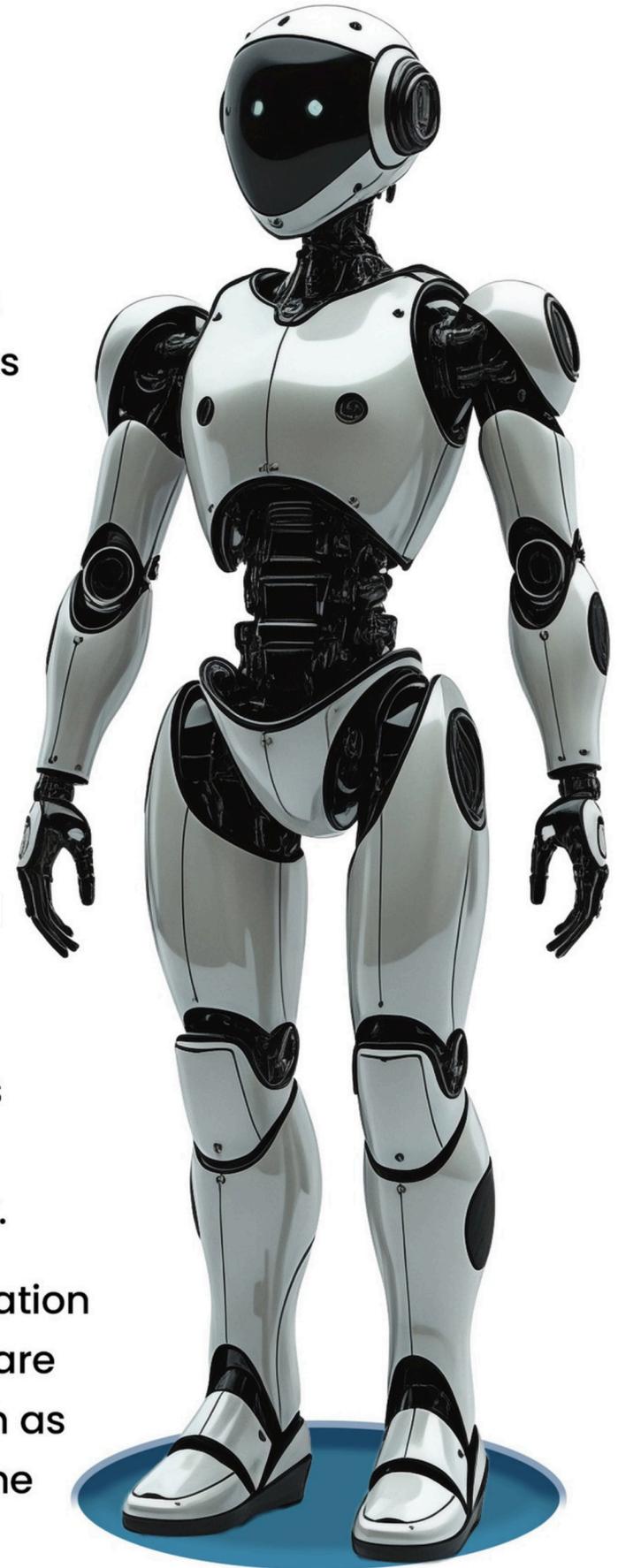
Another early example often cited as one of the first robots is "Shakey the Robot," developed at the Stanford Research Institute (now SRI International) in the late 1960s. Shakey was a mobile robot equipped with a camera, sensors and a computer. It was capable of perceiving its environment, planning its actions and navigating through a room with obstacles.

These early robots set the foundation for further advancements in robotics. since then, the field has grown exponentially with numerous robots being developed for a wide range of applications and industries.

## UTILITIES & APPLICATION OF ROBOT

Robots have a wide range of utilities and applications across various industries and domains. Some of the common utilities of robots include:

- **Manufacturing and Industrial Automation:** Robots are extensively used in manufacturing industries for tasks such as assembly, welding, painting, packaging, and quality control. They can work with precision, speed, and consistency, leading to increased productivity and efficiency.
- **Healthcare and Medical Assistance:** Robots are employed in healthcare settings for tasks like surgery, rehabilitation, patient assistance and drug dispensing. Surgical robots can offer greater precision, minimally invasive procedures and improved outcomes. Assistive robots help individuals with disabilities or the elderly with daily tasks and mobility.
- **Exploration and Space:** Robots are utilized in space exploration to conduct research, gather data, and perform tasks that are challenging or dangerous for humans. Robotic rovers such as Mars rovers have been deployed to explore and analyse the surface of other planets.
- **Agriculture and Farming:** Agricultural robots are also known as agree-bots or farm-bots. These used for tasks such as planting, harvesting, monitoring crops, and applying fertilizers and pesticides. They can improve efficiency, reduce labour costs, and optimize crop yield.
- **Logistics and Warehousing:** Robots play a vital role in logistics and warehousing operations. Autonomous robots can navigate warehouses, pick and pack products, and transport goods, enhancing speed and accuracy in supply chain management.



# ADVANCE ROBOT

## HONDA ASIMO

Honda Motor Corporation's Asimo, with its humanoid appearance and ability to walk and climb stairs, has been dubbed the world's most advanced robot. Yet during the crisis at the Fukushima nuclear power plant, there was surprise that this triumph of Japanese robotic engineering wasn't deployed in the reconnaissance and clean-up operation.



## NAO ROBOT

Nao is available as a research robot for schools, colleges and universities to teach programming and conduct research into human-robot interactions.

In August 2018, Robot-LAB released an online learning platform for schools that enhance the use of NAO for STEM, Coding and Engineering.



## ATLAS ROBOT

Atlas is a bipedal humanoid robot primarily developed by the American robotics company Boston Dynamics with funding and oversight from the U.S. Defense Advanced Research Projects Agency (DARPA).

The robot was initially designed for a variety of search and rescue tasks and was unveiled to the public on July 11, 2013.



# ABOUT

## STEMROBO TECHNOLOGIES



**STEMROBO Technologies Pvt Ltd** is an Indian company that provides education and training services in the field of STEM (Science, Technology, Engineering, and Mathematics) and robotics. The company's aim is to promote hands-on learning and innovation among young students by providing them with educational kits, training programs, and workshops.

Stemrobo Technologies Pvt Ltd offers a range of products and services, including robotics kits, coding kits, and educational software. The company's products are designed to be user-friendly and provide a fun and engaging way for students to learn about STEM subjects. In addition to its educational products, Stemrobo Technologies Pvt Ltd also conducts workshops and training programs for students, teachers, and educational institutions. These programs are designed to help participants learn the basics of robotics and coding, and develop their skills in these areas.

### Importance of STEM Education for Kids

The term "STEM" typically refers to a group of academic disciplines that are focused on science, technology, engineering, and mathematics. It prepares them for the future by building problem-solving skills, encouraging curiosity and exploration, fostering collaboration and communication skills, and addressing global challenges that require STEM principles for their solution.

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## ABOUT ROBOTIC LAB



The Robotics Lab is a dedicated workspace where students can learn, experiment, and transform their ideas into prototypes. Designed to foster creativity beyond rote learning, the lab encourages students to explore futuristic skills such as design and computational thinking, adaptive learning, and artificial intelligence.

Equipped with state-of-the-art tools and equipment like 3D printers, robotics kits, and electronic components, the Robotics Lab provides a hands-on learning experience in science, technology, engineering, and mathematics (STEM) fields. The primary goal is to cultivate problem-solving and critical thinking skills from an early age. By promoting experimentation and innovation, the lab aims to nurture the next generation of innovators and entrepreneurs, preparing them for future challenges and contributing to the overall development of India's technological landscape.



### ROBOTIC FUN FACT

Sophia, a famous humanoid robot, became the first robot to be granted citizenship in Saudi Arabia in 2017.

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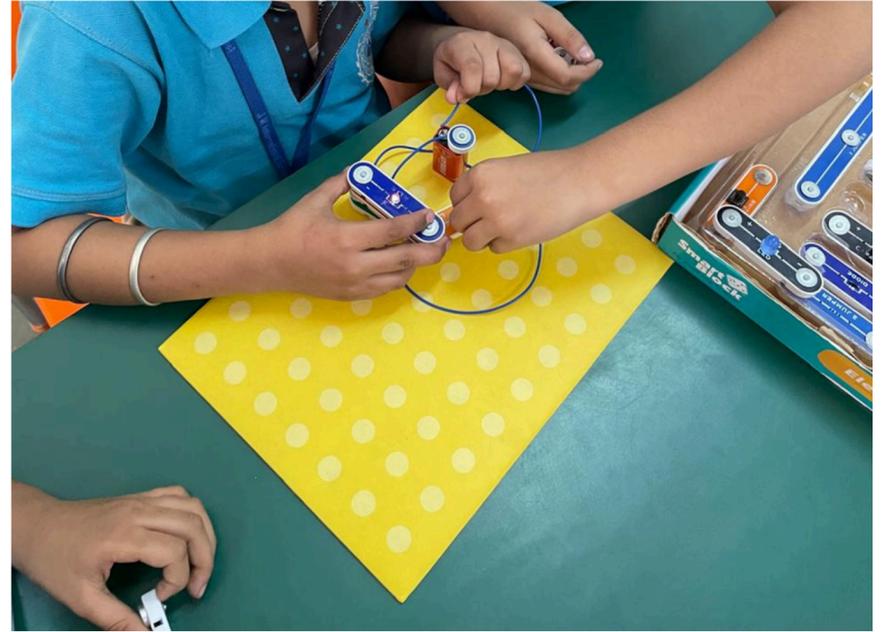
## GLIMPSE OF ACTIVITIES

### Grade I – Smart Circuit Kit

Students explored basic electrical concepts through hands-on activities using the Smart Circuit Kit. They learned how circuits work, boosting curiosity, logical thinking, and practical understanding of electricity.

#### Activities included:

- **Light Up a Bulb:** Discovered how electricity flows in a closed circuit. Students connected wires, switches, and a bulb to observe how power lights up the bulb.
- **Spin a Motor:** Learned how electrical energy converts into mechanical motion. Students connected a motor and observed how it spins when powered.
- **Torch Light:** Built a simple handheld torch circuit. Students understood how series connections and switches control the light efficiently.



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## GLIMPSE OF ACTIVITIES

### Grade II – Smart Circuit Kit

Students engaged in exciting hands-on experiments using the Smart Circuit Kit to explore real-life applications of sensors and electronic components. These activities enhanced their creativity, analytical thinking, and understanding of automation in daily life.

#### Activities included:

- **Car Music Volume Control:** Explored how sound sensors respond to noise levels. Students observed how volume changes automatically depending on the surrounding sound intensity.
- **Fire Alarm System:** Understood how temperature and smoke sensors work for safety. Students built a circuit that activates a buzzer when it senses high heat, simulating a real fire alarm.



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## GLIMPSE OF ACTIVITIES

### Grade III – Smart Circuit Kit

Students explored basic electrical concepts using the Smart Circuit Kit. These hands-on activities helped them understand how electricity flows, how circuits work, and the practical applications of simple electronic components.

#### Activities included:

- **Introduction to SMART Circuit:** Students learned the fundamentals of circuits, including connecting wires, bulbs, buzzers, and switches. They understood how electricity flows in a closed circuit.
- **Torch Light:** Students created a simple handheld torch using a battery, switch, and LED. They understood how series and parallel connections work to power a device efficiently.



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# GLIMPSE OF ACTIVITIES

### Grade IV – STEMbot Micro:bit Kit

Students explored coding and electronics through fun, interactive projects using the Micro:bit Kit. They learned how sensors, LEDs, and programming logic can bring their ideas to life, building creativity, coding confidence, and problem-solving skills.

#### Activities included:

- **Name Badge:** Students coded their own digital name badge using the Micro:bit's LED display. They learned how to scroll text and customize their names using simple block-based coding.
- **Clap Heart:** Through this activity, students understood how sound sensors work. They programmed the Micro:bit to display a glowing heart on the LED screen whenever a clap sound was detected.
- **Touch Heart:** Students explored touch sensitivity by programming the Micro:bit to display a heart when touched, learning about input sensing and interactive electronics.



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# GLIMPSE OF ACTIVITIES

### Grade V – Paper Circuit & Robot Kit

Students combined creativity and technology to explore robotics and paper circuits. These activities encouraged imagination, teamwork, and an understanding of how circuits and sensors bring designs to life.

#### Activities included:

- **Flower Birdy:** Students designed a colorful flower and bird model integrated with a simple circuit. They learned how to connect LEDs and power sources to make their artwork glow beautifully.
- **Talking Toad:** Using the Paper Circuit Kit, students created a “Talking Toad” model that responds through light and sound. They explored how circuits can be used to simulate real-life interactions.
- **Robot Activity:** Students assembled and programmed a simple robot, learning about movement control, sensors, and basic robotics principles. This activity introduced them to the world of automation and engineering logic.



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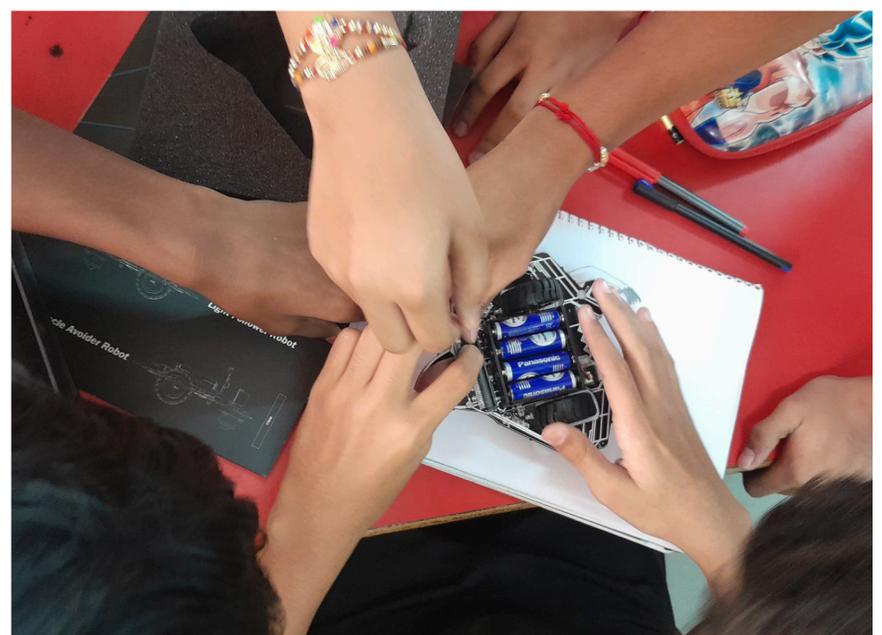
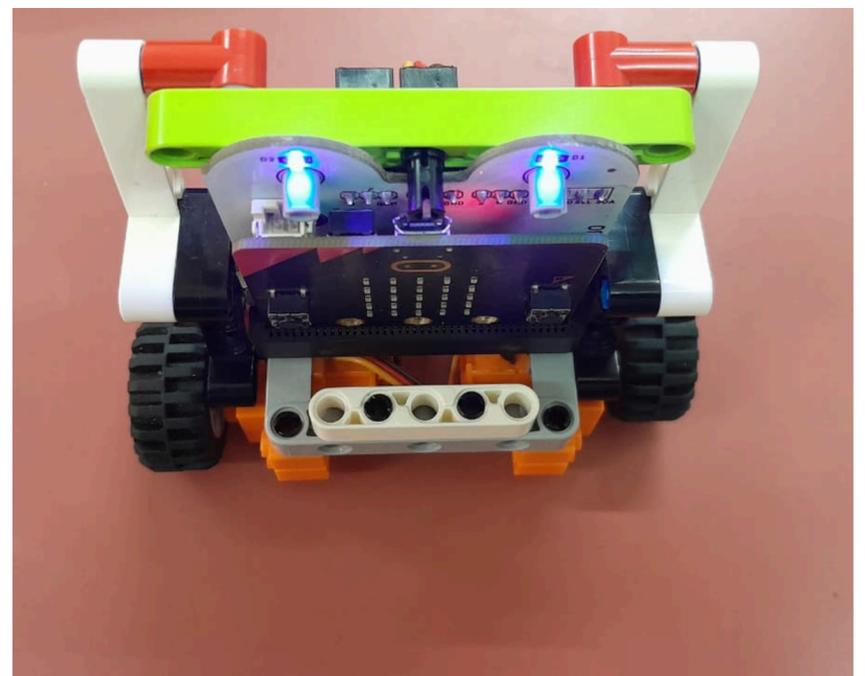
## GLIMPSE OF ACTIVITIES

### Grade VI – STEMbot Kit & Drone Training

Students advanced their understanding of robotics, sensors, and aerodynamics through hands-on projects and flight sessions. These activities enhanced their problem-solving abilities, logical reasoning, and interest in modern technologies like automation and drones.

#### Activities included:

- **Night Light:** Students built an automatic night lamp using the STEMbot Kit. They learned how light sensors detect darkness to switch on the LED, understanding real-life applications of smart lighting systems.
- **Direction Finder Robot:** Students programmed a robot that detects obstacles and finds its way using sensor feedback. They explored robotics principles like motor control, direction logic, and sensor-based navigation.
- **Drone Training:** Students were introduced to drone technology and flight control. They learned about the science behind lift, thrust, pitch, and yaw while practicing safe flying techniques and understanding drone components.



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## GLIMPSE OF ACTIVITIES

### Grade VII – 3D Designing & Printing (Arctic 3D Printer by STEMROBO)

Students explored the world of 3D design and digital fabrication using the Arctic 3D Printer developed by STEMROBO. They learned how ideas can be transformed from imagination to tangible models, improving their design thinking, precision, and creativity.

#### Activities included:

- **Designing Process – Embossing and Engraving of Texts:** Students learned the basics of 3D design by creating embossed and engraved text models. They understood how depth, layering, and detailing work is done in digital design software before printing.
- **School Name Badge – 3D Designing:** Students designed and printed their school name badges, personalizing them with text and symbols. This activity helped them grasp the concept of prototyping and product customization using 3D technology.



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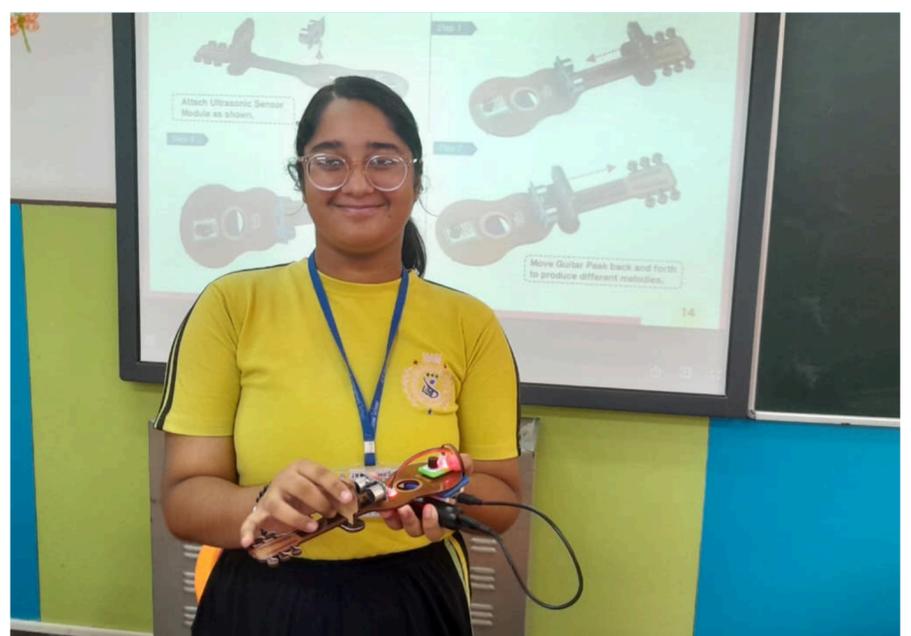
## GLIMPSE OF ACTIVITIES

### Grade VIII – Tinker Orbit PBL Kit & STEMbot Kit

Students explored advanced electronics, automation, and creative design through the integration of coding, sensors, and Bluetooth technology. These activities helped them understand modern engineering concepts, innovation, and real-world applications of robotics and sound-based projects.

#### Activities included:

- **Smart Guitar (Tinker Orbit PBL Kit):** Students created a musical project using sensors and coding to simulate a smart guitar. They learned how touch and sound sensors can generate musical tones, exploring the relationship between electronics and music.
- **Bluetooth Control Robot (STEMbot Kit):** Students assembled and programmed a robot that can be controlled via a smartphone using Bluetooth connectivity. Through this activity, they understood wireless communication, motor control, and the basics of IoT (Internet of Things) technology.



### ROBOTIC FACT

In 2020, a humanoid robot named Promobot was hired to work at a train station in Russia, providing information and assistance to passengers.



## — ACHIEVEMENTS —

### AT A GLANCE

- We have completed 60% of our robotics curriculum, keeping students engaged and excited throughout the process.
- Beyond the curriculum, we've introduced activities that spark curiosity and enhance technical understanding, laying a strong foundation for future careers.
- Our focus is on building a solid base in robotics, with plans to introduce advanced concepts like AI and automation in the coming months.
- Kits like Linker Connectors/Block Kits, Micro:bit, Mechatron, Electronics Basic Kit, Tinker Orbit, are boosting students' creativity, focus, and technical skills in electronics and programming.
- These hands-on tools and activities equip students with essential skills, preparing them to become innovators and stay ahead in the world of technology.



#### ROBOTIC FUN FACT

Robotic prosthesis can read brain signals and they work like a real human body part.



# THANK YOU



## CONTACT US

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Visit our website– [www.stemrobo.com](http://www.stemrobo.com)