

North Star International Academy

STEM Update - June' 25



STEM Update - June 2025

Grade: I

Course: Early Mechanics

- This month, students explored real-world mechanical concepts by building amusement ride-inspired structures that helped them understand motion, balance, and mechanisms in a fun, hands-on way.

Key Learning Points:

1. **Merry-Go-Round – Understanding Rotational Motion:** Students learned how circular movement works by building a rotating **merry-go-round** model.
2. **See-Saw – Understanding Balance and Pivot Points:** By assembling a **see-saw**, students explored the concept of **pivot points** and how equal weight distribution affects balance.
3. **Rainbow Ride – Learning About Amusement Ride Mechanisms:** Students built a colorful **rainbow ride** to understand how amusement rides use **linkages and rotation** to move parts in a coordinated way.



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Grade: II & III

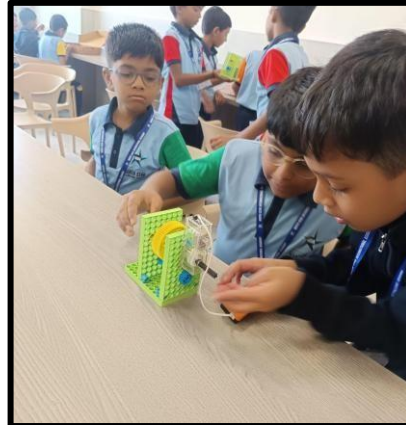
Course: Simple Motorized Structures

- This month students were engaged in hands-on building activities that deepened their understanding of mechanical movement, gear systems, and the role of motors in creating real-life machines.

Key Learning Points:

1. **Gear Ratio Activity – Speed & Torque Relationship:** Students experimented with different **gear combinations** to learn how **gear ratios** affect the speed and strength (torque) of rotating parts.
2. **Swing Machine Activity – Exploring Oscillatory Motion:** By building a **swing machine**, students discovered how **gears** and **linkages** can produce **back-and-forth (oscillatory)** motion.
3. **Crushing Machine Activity – Force & Compression Mechanisms:** In this activity, students assembled a **crushing mechanism** to see how **force is transferred** and used to compress.

They understood the basic concept of applying force through simple gear-driven machines.



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Grade: IV

Course: Click Drag Design – 2

- This month, students learned to manipulate objects in 3D space by adjusting dimensions, scale, and orientation — giving them confidence in basic design thinking and spatial awareness.

Key Learning Points:

Activity 3 – DNA (Understanding Scientific Models in 3D): Students explored how to model DNA structure digitally, learning how to represent a scientific concept through 3D design. They practiced scaling, aligning, and positioning parts to create a model that shows the **double helix shape**, maintaining correct proportions and symmetry.

Activity 4 – Phone Stand (Designing Practical Objects): By designing a phone stand, students learned how to work with angles, radius, and grouping commands to create a stable 3D model. They understood how multiple shapes combine to form a **functional object**, reinforcing spatial reasoning and part-to-whole relationships.



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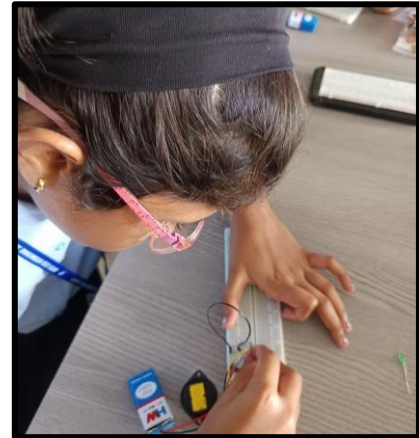
Grade: V-VI

Course: OMOTOOLS Electronics

- This month, students expanded their understanding of electronics by exploring sound and input-based circuits using the OMOTOOLS Electronics Kit. They were introduced to buzzers as sound output devices and learned how different types of switches — like push buttons — control the flow of current in a circuit.

Key Learning Points:

1. **Activity – Beeping of Buzzer (Sound as Output):** Students were introduced to the **buzzer** as an output device that converts **electrical signals into sound**.
They learned how to connect and power the buzzer correctly and understood its real-world applications in alarms and alerts.
2. **Activity – Push Button Control LED (Learning Switches):** Students explored different **types of switches** such as **push buttons, slide switches, and rotary switches**.
They focused on **push buttons** to control LED circuits, learning how **circuits are completed or broken** through manual inputs.



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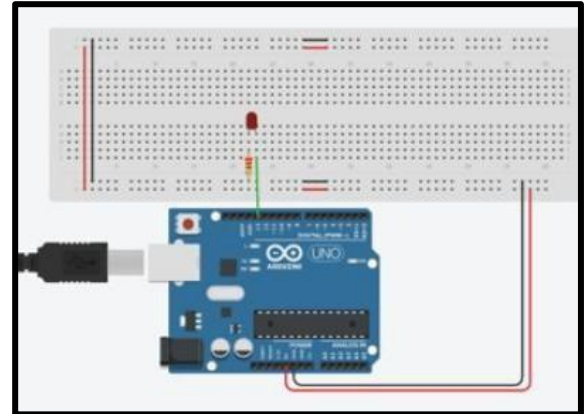
Grade: VII-VIII

Course: OMOTOOLS Arduino

- This month, students were introduced to the world of **physical computing** using the **OMOTOOLS Arduino Kit**, exploring how hardware and software work together..

Key Learning Points:

1. **Activity – Traffic Light Simulation (Real-world Automation):**
Students interfaced multiple LEDs with the Arduino microcontroller to create a real-life traffic light simulation.
They learned how to control multiple outputs through timing-based code, applying logic to mimic real-world traffic sequences.
2. **Activity – Push Button Control (Input-Based Automation):**
Students understood how microcontrollers receive inputs and respond through outputs.
They wrote Arduino code to control an LED using a push button, reinforcing the concept of making and breaking circuits through digital input.



Star Of The Class

SR.NO	GRADE	DIVISION	NAME OF THE STUDENT'S
1.	I	D	Saiee Santosh Sanap
2.	II	B	Christina Singh
3.	III	A	Advik Pramod Sanap
4.	IV	A	Swaram

Star Of The Class

SR.NO	GRADE	DIVISION	NAME OF THE STUDENT'S
5.	V	A	Falak Jain
6.	VI	A	Riddhima
7.	VII	A	Raghav Dwivedi
8.	VIII	A	Dhruv Sanjay Bhalerao



“COBOT”

More than a Robot

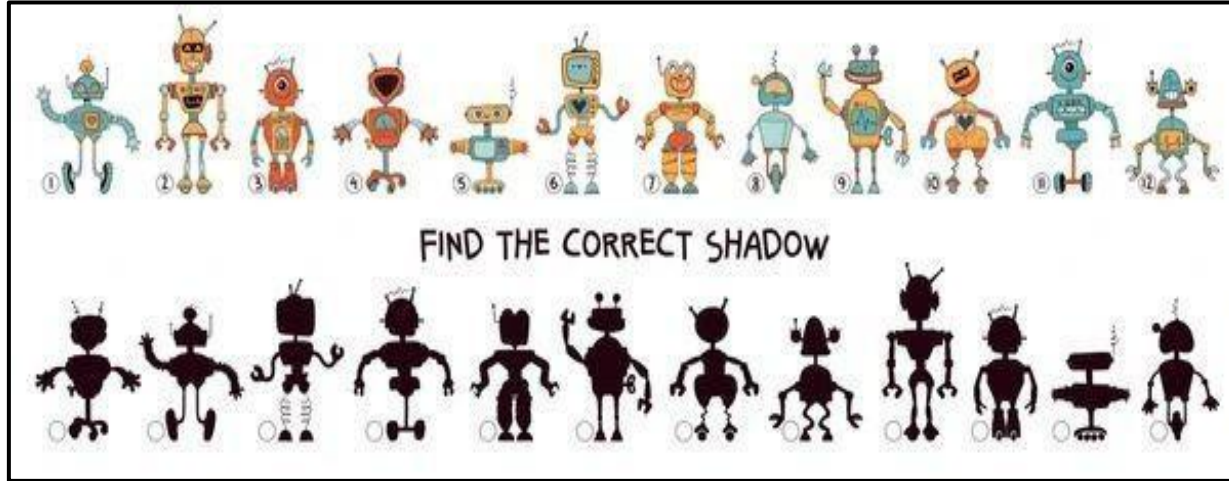
The term cobot or collaborative robot is relatively new and describes a robot that is working alongside humans and supports them in their tasks without the need for a safety barrier. They are designed to share the same workspace, often considerably smaller than industrial robots and easy to use. The main difference between cobots and industrial robots is that industrial robots are autonomous machines that often function with a minimal level of human interaction.

Cobots can perform numerous tasks depending on their design. To allow manufacturers to maintain flexibility during small-scale productions, solutions by ESSERT Robotics can be combined with equipment for different production steps and also allow collaboration with humans.





PLAY TIME



FIND MISSING PARTS FOR ROBOTS

