CAMPUS

Mini Makers

From Idea to Invention

Startup School for Kids:
Building Robots, Learning Science, Growing Confidence.

A full-year entrepreneurship experience where children become real-world innovators. This course mirrors the full startup journey — from idea to product launch. Along the way, kids will build their own robot while mastering product design, hardware engineering, and software development. Traditional subjects like physics, mathematics, and coding are taught creatively through hands-on robotics — making academic learning exciting, purposeful, and fun.

Information

- 41 lessons (1.5 hours each)
- English instruction
- Beginner to Intermediate
- Ages 6–12

What to Expect

- **Pitch your robot to real investors** on demo day
- **Earn a certificate** in robotics and innovation
- **Design and prototype custom parts** with 3D tools
- **Build and bring** home your own RICE mini robot
- Learn **physics, maths, engineering**, and **coding** through hands-on projects
- Code sensors and motors using **Micro:bit**

Unit	What they'll learn	Skills & Takeaways

1 Programming

Learn to code with Micro:bit to build mini apps and games using sensors and sound.

- Get hands-on with the Micro:bit, identifying buttons, sensors, LED display, and ports
- Use a block-based coding editor to build interactive programs
- Create mini projects like a step counter, alarm, and music player
- Explore how inputs (light, movement, button presses) trigger digital responses
- Use loops to automate sequences and functions to simplify code

Computer Science
- Loops and functions
- Variables and conditionals
- Block-based programming
- Event-driven programming
- Debugging and problem solving

Mathematics
- Logical reasoning and sequencing
- Abstract thinking and pattern recognition

2 Robotics Engineering

Assemble your own robot, wire its circuits, and bring it to life with code and sensors.

- Build basic electric circuits with bulbs, switches, and batteries
- Watch a live demo of motor function using magnets and coils
- Assemble the robot while documenting the process
- Program it to move, stop, and respond to ultrasonic sensors
- Use a QR code scanner to give commands like "go", "stop", "turn left", or "turn right"

Physics
- Electromagnetism
- Electric circuits
- Distance measurement with sound waves

Engineering
- Mechanical assembly
- Wiring and integration
- Troubleshooting systems

Computer Science
- Programming motor behavior
- Integrating sensor data

3 Delivery Robot

Turn your robot into a smart delivery bot that measures speed, navigates space, and follows user commands.

- Conduct timed trials to measure speed over a set distance
- Use formulas to calculate robot speed and adjust code
- Map classroom "delivery zones" and plan obstacle-free paths
- Program delivery and return paths using QR codes
- Customize screen messages to enhance the user experience

Physics
- Speed and velocity
- Rotational angles and movement geometry

Mathematics
- Measurement in robotics
- Formulas for movement durations

Computer Science
- Navigation coding
- UI/UX logic

4 Computer-Aided Design (CAD)

Design, 3D print and test your own robot upgrades, from tool attachments to moving arms.

- Use Tinkercad to model 3D shapes and combine them to form functional objects
- Design mounts and attachments for motors, LEDs, and servosthat extend what their robot can do
- Complete the design cycle: ideation, modeling, printing, testing & revising
- Build problem-solving accessories like item holders or camera mounts
- Attach their 3D-printed parts to the robot and write code to operate them

Design & Technology
- Prototyping for function
- Use of Tinkercad
- 3D modelling techniques

Engineering
- Iterative product development
- Integration of components

Mathematics
- Spatial reasoning
- Measurement accuracy

5 Entrepreneurial Pitching

Wrap it all up with a founder-style pitch. Showcase your robot and share your invention journey.

- Organise photos, videos, and documentation from earlier units into a compelling project story
- Design pitch slides to explain the problem their robot solves and how it works
- Practise voice projection, body language, and engaging delivery
- Prepare for a final live demo day where they present their robot to an audience

Communication
- Persuasive presentations
- Technical storytelling
- Live demonstration skills

Design & Technology
- Slide design
- Creation of presentation materials

Personal Development
- Confidence and articulation
- Reflection on learning journey