TESCA™
www.tescaglobal.com

AI & ROBOTIC LAB-2
Order Code - STEM-ARL2

Tesca Labs for schools provides the perfect platform for students to develop the necessary technical knowledge to become future-ready. The platform is designed to help students gain an indepth understanding of coding, Artificial Intelligence, and Robotics through hands-on experiments.

With the help of our cutting-edge technology, students can explore, experiment, and build projects of their own, all while developing their critical thinking and problem-solving skills.

Equipping students with the skills needed to thrive in the 21st century is imperative for success.

With the International curriculum stressing the need for AI-powered education, Tesca Labs is the perfect solution to help students realize their full potential and become future-ready

Key Activities to be covered under the Lab:


Programming


Artificial Intelligence


Interactive AI Projects


Robotic


Robot Localization & Automation Technology


Self Driving

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Quarky Ultimate Kit
Qty. - 18

Quarky Explorer Kit
Qty. - 04

Mars Rover Addon Kit
Qty. - 01

Humanoid Robot Addon Kit
Qty. - 01

Alexa Echo with Smart Bulb
Qty. - 01

3.7V Lithium Ion Battery
Qty. - 10

1-Meter-long USB Cable
Qty. - 05

Battery Charging Station
(6 Ports), Qty. - 04

Quarky Motor Bundle
(DC Motor, Mounting Bracket,
Wheel), Qty. - 18

Servo Motor
Qty. - 18

Ultrasonic Sensor 3.3V
Qty. - 10

Jumper Cable
Male-Male - Qty. - 200
Male-Female - Qty. - 120
Female-Female - Qty. - 120

Note: Specifications are subject to change.

01.07.2024

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Alligator Wire
Qty. - 80

Plastic Addon Pack
Qty. - 04

Fastener Addon Pack
Qty. - 04

Cable Tie
Qty. - 08

Self-Driving Arena
Qty. - 18

Activity grade 3-8
{10 books each garde)
Qty. - 60

Flagship Products Quarky Ultimate Kit

Students love to play with hardware toys and kits. And it is also being observed that students involved in practical activities involving hardware have better retention and understanding of the concepts. At an early age, it is recommended that the students play with Abacus to learn mathematics.

Robotics is a very good tool to create engagement in kids to learn to code and develop computational thinking. It can be used to engage students in real-life problem-solving.

Tesca offers a one-stop solution for engaging students in Robotics with a focus on coding and AI. Quarky has a lot of features inbuilt allowing students to focus on conceptual understanding of physical computing, robotics locomotion, autonomous robots, self- driving cars, and automation in a very interactive way. Quarky can connect with PictoBlox using BLE or USB cable and has inbuilt short circuit protection making it safe for students.

Note: Specifications are subject to change.

IT-2013, Ramchandrapura Industrial Area, Sitapura Extension, Near Bombay Hospital, Vidhani Circle, Jaipur-302022, Rajasthan, India,
Tel: +91-9829132777; Email: info@tesca.in, tesca.technologies@gmail.com

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Learn Industry-Standard Concepts
Tesca helps you understand widely used artificial intelligence concepts such as machine learning (self-driving cars), face recognition (face unlock), speech recognition (Alexa), etc.

One Infinite Kit Creations
Quarky can become anything and do anything that you want it to. You can make hundreds of interactive real-world applications-based projects such as an expression detector, AI delivery bot, home automation system, etc.

Just Plug and Start Playing
Quarky has a plug-and-play interface, which means that you can easily connect common electronic components like sensors, motors, servos, etc. without having to solder them.

Programmable with Smartphone & Tab
Code and control all your projects, games, animations, and robots anytime, anywhere using a
Smartphone or a tablet! You can even mount your phone on them to make them completely autonomous.

Robots Configurations

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Robots Configurations

PictoBlox - Learning Coding, AI, and Robotics made easy for Kids

Programmable Using Scratch & Python

Supports

Computer Vision, Natural Language Processing, Object Detection, Human Pose Detection, Speech Recognition, QR Code Scanner, and Machine Learning.

2. The objective of learning AI with PictoBlox is to engage students to create their own AI applications rather than going in-depth with the mathematics of neural networks. For example, with the following simple script the students can make a face filter in PictoBlox:

3. PictoBlox also allows the user to create machine learning models with offline training mode.

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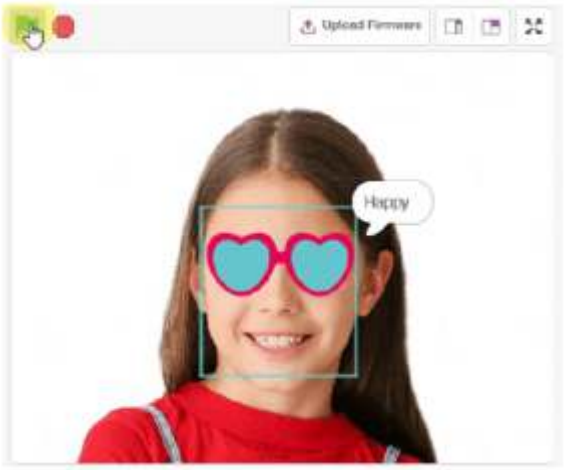
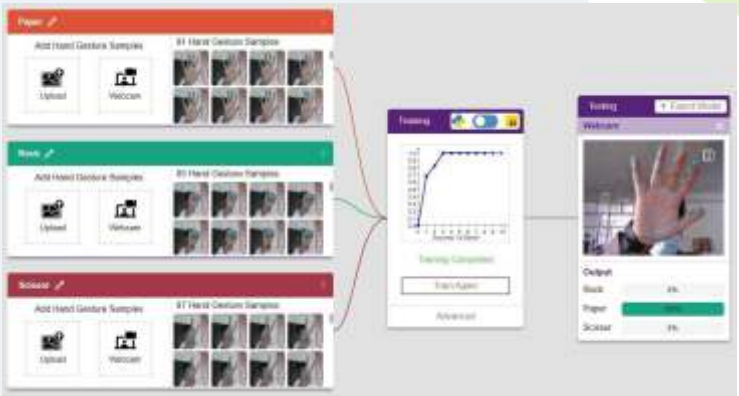
PictoBlox is the coding education software which has both graphical block-based and Python programming:

1. It allows students to add AI capabilities to their projects like Face Detection & Recognition, Computer Vision, Natural Language Processing, Object Detection, Human Pose Detection, Speech Recognition, QR Code Scanner, and Machine Learning.
2. The objective of learning AI with PictoBlox is to engage students to create their own AI applications rather than going in-depth with the mathematics of neural networks. For example, with the following simple script the students can make a face filter in PictoBlox:



3. PictoBlox also allows the user to create machine learning models with offline training mode. This is a very intuitive GUI created to make the process simple for the students. Using this module, students can create their custom ML models and use them in PictoBlox projects.
   - 3.1. Image Classification
   - 3.2. Human Pose Classification
   - 3.3. Hand Pose Classification
   - 3.4. Text Classification
   - 3.5. Object Detection
   - 3.6. Number Regression and Classification
   - 3.7. Audio Classification



4. PictoBlox is also available for Smartphone devices making coding & AI easily available for students who do not have access to a computer or a laptop.
5. As Python is integrated into the same platform it allows students to migrate from blockbased coding to syntax coding with ease.

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6. PictoBlox is compatible with a wide range of hardware devices like Quarky, Arduino Uno, Nano, Mega, ESP32, and many more. This gives students an opportunity to implement coding and AI projects with interactive hardware.

Curriculum & Training for Students

Curriculum

Tesca has a created yearlong curriculum for Classes 3-12 in alignment with the British curriculum. The curriculum is experiential learning focused and will cover the basics and advanced levels of Programming, IoT, Artificial Intelligence, Machine Learning, and Robotics.

It is aligned with the international curriculum for Coding & AI Skill subjects.

Stage (Class)	Curriculum Objectives	Concepts Covered
Preparatory (Class 3-5)	Play, discovery, and activity-based and interactive classroom learning.	- Graphical Programming - Game, Story, and Quiz - AI and ML Activities - Physical Computing and Robotics
Middle Stage (Class 6-8)	Experiential learning aligned with Coding & AI skill subjects as per International Curriculum.	- Coding (as per Skill Subject) - Artificial Intelligence (as per Skill Subject) - Physical Computing and Automation - Robotics, Design Thinking, and Tinkering
Secondary (Class 9-12)	Coding, AI and Robotics with Python aligned with AI skill subject.	- Python Basics (as per Computer Science) - Artificial Intelligence (as per Skill Subject) - Physical Computing and Robotics with Python - Tinkering

Training of Students

The school will appoint teachers for student training on the curriculum. The student training will be conducted in the following method:

- Students will have 30 teaching sessions (1 class of 40 minutes weekly) per year
- Each year, students will make capstone projects where they will be given problem statements to work on, based on their learning from the curriculum
- Students will have 5 additional sessions for doubt clearing, exhibition & presentations
- Students will get certificates after completion of each year which will be accredited by tesca

Capacity Building Program and Handholding for Teachers

Tesca will help existing computer science teachers build their capacity so they can effectively teach the curriculum. Capacity building involves providing 3 days of virtual teacher training during the program to