CURRICULUM

GRADE 6-8 YEAR 2

S.no	Kit/Platform Used	Concept Covered with Activity / Project Name	Activity/Project Details or Coverage	Inter-Disciplinary Learning Outcome around STEM/Maths/Science
1	Pre-assessment Quiz : Robots			
2	 Tinker Orbits	Smart Morning Alarm	Create a "Smart Morning Alarm" using the Tinker Orbits kit. No programming required. Connect components to the power distribution board, power up with a bank, and experience the light-sensitive alarm.	**Electrical Concepts:** Understand power distribution while crafting a light-sensitive alarm. **Mathematical Application:** Calculate circuit connections for the alarm mechanism. **Technology Integration:** Utilize ICT without programming for a smart alarm.
3		Activate the laser beam	In the "Activate the Laser Beam" activity with Tinker Orbits, connect components without programming. Plug them into the power distribution board, power up with a bank, and witness the laser beam!	**Circuit Mastery:** Learn power distribution without programming, engaging STEM principles. **Scientific Observation:** Witness laser beam effects, connecting science to electronics. **Technology Integration:** Utilize ICT for hands-on experimentation, enhancing practical skills.
4		controlling laser with IR sensor	Experience laser control with the Tinker Orbits kit. Utilize IR sensors, the power distribution board, and a power bank to create an engaging, plug-and-play activity without any programming required.	**Light Physics Mastery:** Explore lasers, IR sensors for STEM and science. **Mathematical Logic:** Apply sensor data without complex calculations. **ICT Integration:** Harness tech for an engaging, no-code hands-on experience.
5		Fan speed control using Potentiometer	Explore fan speed control with Tinker Orbits kit. Plug components into the power distribution board; use a potentiometer to adjust the fan's speed, showcasing electronics principles practically.	**Electronics Proficiency**: Learn principles through fan speed control experimentation. **Mathematical Application:** Apply potentiometer adjustments, linking math to real-world circuits. **ICT Integration:** Develop digital skills using Tinker Orbits technology platform.
6	 Tinker Orbits PBL	HeliBot	Experience helicopter engineering with the Tinker Orbits PBL Kit. Build the chopper using MDF components, attach a motor for blade rotation, and incorporate 2 LED modules for realistic illumination when activated. A hands-on exploration of mechanics and electronics.	**Mechanical Understanding:** Construct helicopter, merging STEM and engineering concepts. **Mathematical Application:** Calculate rotations, linking math to rotor dynamics. **Technology Integration:** Implement LED modules, blending ICT with engineering.
7		Smart Guitar	Build a Smart Guitar with Tinker Orbits PBL Kit. Assemble an MDF guitar structure, then employ an ultrasonic sensor to detect hand movements and produce corresponding sounds using a buzzer. A harmonious fusion of construction and technology.	**Acoustic Science:** Explore sound production, linking STEM, math, and technology. **Mathematical Logic:** Calculate sensor interactions, connecting math to real-world applications. **Digital Creativity:** Program smart guitar, fostering ICT and artistic expression.
8	Quiz: Tinker Orbits			
9	Project - 1: Theme- Sustainable Cities and Communities (UN Goal -11)			
10	 STEMBOT	Temp & Humidity Monitoring Robot	A temperature and humidity monitoring robot using STEMBOT is an intelligent robotic system equipped with sensors and programming capabilities that enable it to measure and analyze temperature and humidity levels in various environments.	**Scientific Analysis:** Probe temperature and humidity using STEMbot's sensors. **Mathematical Data Processing:** Analyze and interpret environmental data statistically. **Technological Proficiency:** Develop ICT skills for sensor-based data acquisition and analysis.
11		Smart Thermobot	The Smart Thermobot usinf STEMBOT is an innovative robot designed to monitor and regulate temperature using the Microbit. This intelligent robot utilizes temperature sensors (DHT11) to measure the surrounding temperature accurately. It can perform various tasks, such as adjusting room temperature, notifying users of temperature changes, and even assisting in climate control systems.	**STEM Integration:** Apply STEM concepts to monitor and regulate temperature. **Scientific Precision:** Utilize DHT11 sensors for accurate temperature measurement. **Mathematical Logic:** Calculate and adjust temperature settings, linking math and science.
12		Air quality monitoring robot	The Air Quality Monitoring Robot using STEMBOT and equipped with the MQ-6 gas sensor, is an intelligent and versatile device designed to assess and track the quality of the air we breathe. This innovative robot combines the capabilities of Microbit, a powerful microcontroller, and the MQ-6 sensor, which specializes in detecting flammable gases like LPG and butane.	**Environmental Understanding:** Learn air quality with STEM and science integration. **Mathematical Analysis:** Analyze sensor data, applying mathematical concepts. **Technological Proficiency:** Interface Microbit and MQ-6 sensor for ICT skills.
13	Quiz: MicroBit			
14	Project - 2: Theme Good Health and Well-being (UN Goal -3)			
15	 Basic Electronics Kit	Brightness Control of LED	Using a Breadboard kit, modulate LED brightness, teaching circuitry and electronics basics through hands-on exploration of light control	**Circuit Comprehension:** Learn electronics fundamentals via hands-on LED brightness modulation. **Mathematical Analysis:** Apply math to adjust light intensity, reinforcing math skills. **Scientific Inquiry:** Explore light properties, fostering scientific curiosity and experimentation.
16		Working of a Seven Segment Display (Display your favourite number)	"Display Your Favorite Number" with the Breadboard Kit. Students configure a 7-segment display to showcase their chosen numbers, honing electronics skills and numerical understanding in a fun project.	**Electronic Proficiency:** Configure 7-segment display, advancing STEM and electronics knowledge. **Mathematical Application:** Represent numbers, linking math to practical circuits. **Hands-On Learning:** Engage in fun project, nurturing a love for STEM.

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17	Basic Electronics Kit	Interfacing IR Sensor (Automatic fan)	Create an automatic fan system using a motor and IR sensor with the breadboard kit. Learn basic electronics, motor control, and sensor technology while crafting a functional project.	**Electrical Knowledge:** Comprehend circuits, motors, and IR sensor functionality. **Mathematical Application:** Calculate fan speed control through electronic components. **Scientific Inquiry**: Explore sensor technology, linking STEM disciplines effectively.
18	Quiz: Breadboard			
19	 Arduino Robotics Kit	LED Brightness Control	In this Arduino Robotics activity, students utilize PWM pins to control LED brightness. Through hands-on programming, they learn about Pulse Width Modulation and its applications in adjusting light intensity.	**Electronics Fundamentals:** Explore PWM, connecting STEM, and science concepts. **Mathematical Programming:** Apply math in adjusting LED brightness with precision. **Hands-On Coding:** Develop programming skills while controlling light intensity effectively.
20		Seven Segment Display interfacing	Explore Arduino Robotics Kit's educational potential with Seven Segment Display interfacing. Learn about coding, electrical connections, and number display through hands-on experimentation and creative projects.	**Coding Proficiency:** Develop coding skills, connecting STEM with programming logic. **Electrical Circuitry**: Understand connections, bridging science and technology concepts. **Mathematical Visualization:** Learn numerical display, enhancing math comprehension practically.
21		Intruder Alarm System	Create an Intruder Alarm System with Arduino Robotics Kit. Utilize infrared sensors to detect movement and trigger a buzzer alert, enhancing programming, and sensor integration skills.	**Sensor Integration:** Combine infrared sensors, programming, fostering STEM understanding. **Mathematical Logic:** Apply logic for alarm system, linking math and technology. **Scientific Exploration:** Study sensor behavior, integrating physics and robotics concepts.
22	Quiz: Arduino			
23	Project - 3: Theme-Responsible Consumption and Production (UN Goal -12)			
24	 Drone	Flying a Drone	Explain the calibration and flying process of a drone to students	**STEM Knowledge:** Understand drone calibration, linking science, technology, and engineering. **Mathematics Application:** Apply math for flight planning and navigation. **Scientific Process:** Learn scientific principles behind drone functionality.
25	 3D Printer	Designing Process- Embressing and Engraving of texts	Explain the process to design a model on TinkerCAD Platform	**Engineering Skills:** Apply design principles, enhancing creativity and problem-solving. **Mathematical Concepts:** Utilize geometry and measurements for accurate model creation. **Scientific Application:** Understand real-world connections, fostering scientific inquiry.
26		School Name Badge	Make a design for School Name Badge on TinkerCAD	**Mathematical Precision:** Apply geometry for badge layout and proportions. **Scientific Creativity:** Explore materials and color science in design. **STEM Integration:** Blend technology for 3D modeling and innovation.
27	Quiz: 3D Printer			
28	Python Programming (AI-Connect)	Design calculator	Program to create a calculator using python programming	**Math Proficiency:** Enhance mathematical skills through calculator design with AI. **Scientific Understanding:** Learn AI's role in computation and problem-solving. **STEM Integration:** Explore the intersection of math, science, and technology.
29		Area of Square and rectangle	Find area of square and triangles using python programming	**Mathematical Understanding:** Apply Python programming to calculate areas, enhancing math skills. **Scientific Inquiry:** Explore geometric concepts and patterns in real-world objects. **Computational Thinking:** Develop problem-solving skills using block-based coding.
30		Identify the type of Triangle	Identify if the type of triangle is acute, obtuse or right angled based on its angle values	**Mathematical Reasoning:** Apply angle measurement concepts to classify triangles accurately. **Scientific Method:** Utilize AI for data analysis, enhancing precision. **STEM Integration:** Combine coding and geometry for practical problem-solving.
31	Quiz: AI Connect			
32	Project -4: Industry, Innovation and Infrastructure (UN Goal -9)			