

AeroBay Curriculum < GRADE 4		
Session No.	Session Topic (Grade 4)	Objective
Session 1	<p>STEAM Unlocked: Tools & Tech for tomorrow</p> <p>Let's explore the world of STEAM education and the technology shaping our future! Get hands-on experience with advanced machinery like 3D printers and CNC machines, learn to use measuring tools, and work with mechanical and electronic tools to design, build, and innovate.</p> <p>Lab tools included: Mechanical Tools hands on</p>	Students will understand the importance of STEAM education and its role in innovation. They will get hands-on experience with measuring tools like weighing machines, measuring tapes and explore advanced machinery such as 3D printers, CNC machines, and weather stations, and observe the working of mechanical and electronic tools
Session 2	<p>Power Grip: The Science of Mechanical Claws</p> <p>Let's explore the world of forces and mechanical linkages by building a mechanical claw!</p> <p>Kit included: Mech Gripper (Take away)</p>	Students will build a mechanical claw to understand the principles of force, motion, and mechanical advantage. They will explore how simple machines like levers and linkages work together to enhance movement and gripping power. By the end of the session, students will apply their learning to real-world applications in robotics, industry, and assistive technology.
Session 3	<p>Gravity Defier: The Impossible Table</p> <p>Let's challenge our understanding of balance and stability by building an "Impossible Table"! Explore the principles of tension, compression, and equilibrium as they create a structure that appears to defy gravity.</p> <p>Kit included: Anti Gravity Surface (Take away)</p>	Students will construct a suspension-based table to understand the concepts of balance, stability, and force distribution. They will explore how structures maintain equilibrium through tension and compression, applying this knowledge to real-world engineering marvels such as suspension bridges and architectural designs.
Session 4	<p>Spin Master: The Homopolar Motor</p> <p>Let's bring electromagnetism to life by building a simple homopolar motor! Explore the relationship between electricity and magnetism as you create a spinning motor using just a battery, wire, and a magnet.</p> <p>Kit included: Spin Master (Take away)</p>	Students will construct a homopolar motor to understand the principles of electromagnetism and Lorentz force. They will explore how electric currents interact with magnetic fields to produce motion, applying this knowledge to real-world applications such as electric motors and generators.
Session 5	<p>Aqua Sprint: The Rubber-Powered Boat</p> <p>Set sail with your very own rubber-powered boat! Discover how stored energy in a twisted rubber band transforms into motion, propelling your boat forward. Explore the science behind potential and kinetic energy while designing, building, and testing your own watercraft!</p> <p>Kit included: Elasti Kraft Boat (Take away)</p>	In this session, students will explore the concepts of energy transformation, forces, and buoyancy by designing and testing a rubber-powered boat. Through hands-on experimentation, they will understand how stored potential energy in a rubber band converts into kinetic energy to propel the boat forward.
Session 6	<p>Aqua Bridge: Build a Floating Pathway</p> <p>Let's explore buoyancy and engineering by designing a bridge that floats on water! Discover how materials, structure, and balance play a role in building stable floating structures.</p> <p>Kit included: Aqua Bridge (Take away)</p>	Students will learn about buoyancy, water displacement, and structural stability by constructing a floating bridge. Through hands-on experimentation, they will explore how different materials affect flotation, understand the role of weight distribution, and test the bridge's strength. This activity will enhance their problem-solving skills while reinforcing key engineering and physics principles.

Session 7-9	<p>DinoBot: Build Your Own Dinosaur Robot</p> <p>Let's step back in time and bring dinosaurs to life with robotics! In this exciting session, you will assemble a mechanical dinosaur and explore how movement works through linkages and mechanisms. Discover how simple machines and forces combine to create motion, just like real prehistoric creatures once roamed the Earth!</p> <p>Kit Included: Dino Bot (Student can choose any 1 take away from Dino Bot and Zipline Robot)</p>	<p>Students will gain a foundational understanding of electronics, circuits, and motor mechanisms through the construction of Military, Bug, and Walk Master robots. They will explore how electronic components work together to power and control robotic movements. Through hands-on building, they will develop problem-solving, engineering, and logical thinking skills, preparing them for future innovations in robotics and automation.</p>
	<p>SkyGlider: The Zipline Bot</p> <p>Get ready for an exciting adventure in motion as we design and build a Zipline Bot! In this session, you will explore how gravity, friction, and pulley mechanisms work together to help a robot glide along a zipline.</p> <p>Kit Included: Zip Bot (Student can choose any 1 take away from Dino Bot and Zipline Robot)</p>	<p>Students will gain a foundational understanding of electronics, circuits, and motor mechanisms through the construction of Military, Bug, and Walk Master robots. They will explore how electronic components work together to power and control robotic movements. Through hands-on building, they will develop problem-solving, engineering, and logical thinking skills, preparing them for future innovations in robotics and automation.</p>
Session 10 -11	<p>3D Doodle</p> <p>let's bring your ideas to life with a 3D pen! Get ready to draw, build, and create in three dimensions!</p> <p>Lab tool included: 3D Pen (for hands on) 3D Pen design (Take away)</p>	<p>Students will understand the concept of 3D shapes and structures through hands-on experience with a 3D pen. They will explore how heated filament solidifies to form physical objects, enhancing their creativity.</p>
Session 12	<p>STEAM Mastery Challenge: Intra-Class Competition</p> <p>Get ready for an exciting STEAM Mastery Challenge, put your learning to the test through an engaging intra-class competition! This session will bring together all the concepts explored in previous activities, allowing students to compete in hands-on challenges that assess their problem-solving skills, creativity, and conceptual understanding.</p> <p>Lab materials included: Prop usage during presentation</p>	<p>Students will be able to apply their knowledge to solve real-world challenges, demonstrate their understanding through hands-on tasks, and enhance their critical thinking and teamwork skills in a competitive environment. They will also evaluate their own proficiency, identify areas for improvement, and build confidence in practical problem-solving and innovation.</p>
Session 13	<p>Smooth Craft: Shaping with Sanding</p> <p>let's refine our woodworking skills by learning the art of sanding! In this hands-on session, you will work with Balsa wood to create smooth surfaces and precise airfoil shapes. Discover how sanding transforms rough materials into aerodynamic forms and master an essential skill in craft and engineering!</p> <p>Lab tool included: Sanding Sticks (for hands on)</p>	<p>Students will develop hand skills in woodworking by learning to sand and shape Balsa wood. They will understand the importance of smoothing surfaces for aerodynamic efficiency, particularly in airfoil design.</p>

Session 14	<p>Aero Glide</p> <p>let's dive into the world of aeromodelling by building a Chuck Glider! In this hands-on session, you will explore how gliders fly, understand the four forces of flight, and experience the thrill of crafting your own aircraft. Get ready to design, build, and launch!</p> <p>Kit included: Chuck Glider - Rio (Take away)</p>	Students will understand the fundamentals of gliders and aeromodelling by constructing a Styro-Balsa Glider. They will explore the role of lift, weight, thrust, and drag in flight and learn how design choices impact aerodynamics.
Session 15	<p>Glide Quest: Soar with your Glider</p> <p>Come, let's take flight! In this exciting session, you will launch and test your Styro-Balsa Glider, experiencing firsthand how gliders soar through the air. Get ready to fly, analyze, and improve!</p> <p>Ground activity: Glider flying by students</p>	Students will gain a deeper understanding of aeromodelling and gliding by flying the Styro-Balsa Gliders they built. They will observe how lift, weight, thrust, and drag interact in real-time and learn how adjustments affect flight performance.
Session 16 -17	<p>Sky Sim: Master the Virtual Skies</p> <p>Take control and fly like a pilot! Understand control surfaces, hand-eye coordination, and real-time flight mechanics as you navigate the virtual skies.</p> <p>Software included: Simulation software Lab tools included: Transmitter, AA Batteries, Simulation cables</p>	Students will develop a practical understanding of flight control and aircraft manoeuvring through flying simulations using a transmitter. They will explore the functions of control surfaces, enhance their hand-eye coordination, and gain confidence in handling a virtual aircraft.
Session 18	<p>RC Takeoff: Pilot the Skies</p> <p>Let's experience the thrill of real flight! In this action-packed session, you will take control of an RC plane using a transmitter, witnessing the principles of flight in action.</p> <p>Ground activity: Ground flying by trainer</p> <p>Lab tools included: 3D Plane, Transmitter and Caddy Box equipment (Anemometer, Battery Checker, Tools)</p>	Students will gain first-hand experience in flying an RC plane using a transmitter. They will understand how control surfaces like ailerons, elevators, and rudders affect flight and develop precision and coordination through real-time piloting.
Session 19	<p>Power Shot: The Ball Shooter Gun</p> <p>Get ready for action as we build a Ball Shooter Gun! Explore the science behind force, motion, and energy transfer by designing and testing your own shooter. Learn how stored energy is converted into motion and how angles and pressure affect accuracy.</p> <p>Kit included: Ball Blaster (Take away)</p>	Students will construct a Ball Shooter Gun to understand the concepts of potential and kinetic energy, projectile motion, and forces. Through experimentation, they will observe how different angles, force application, and elastic energy affect the trajectory and speed of the ball. By testing and modifying their shooter, students will develop problem-solving and design-thinking skills.
Session 20	<p>Sky Rescuer: Rocket with Parachute</p> <p>Launch into an exciting journey of aerodynamics and controlled descent by building a Rocket with a Parachute! Explore the principles of thrust, gravity, air resistance, and drag as you design and test a rocket that soars high and returns safely with the help of a parachute.</p> <p>Kit included: Parachute Rocket (Take away)</p>	Students will construct and launch a parachute-assisted rocket to understand the forces acting on a flying object. They will explore how thrust propels the rocket upward, while gravity pulls it back down, and air resistance slows its descent. By adjusting parachute size and design, students will experiment with controlled landings and gain insights into real-world space missions and safe landings.

<p>Session 21-22</p>	<p>Rocket Blast: Launch Mission</p> <p>Learn about air pressure-based launching and see how your rocket soars to new heights!</p> <p>Ground activity: Air pressure Rocket launching</p>	<p>Students will gain hands-on experience in launching their paper rockets, reinforcing their understanding of Newton's Third Law (action and reaction). They will explore how air pressure propels rockets, analyze the flight path, and observe the effects of stability and aerodynamics.</p>
<p>Session 23</p>	<p>Tech Cruiser: Robotic Car</p> <p>Get ready to design, build, and test your very own Robotic Car! Discover how gears, motors, and power transmission work together to create movement, and explore the fundamentals of mechanical systems and motion control in robotics.</p> <p>Kit included: Robo Cruiser (Take away)</p>	<p>Students will construct a motorized robotic car and learn about the mechanisms behind movement. By assembling components such as wheels, axles, and motors, they will understand how force, friction, and energy transfer play a role in making a robot move efficiently. This session will also introduce the basics of design thinking, encouraging students to modify and optimize their car for better performance.</p>
<p>Session 24</p>	<p>Spotlight: Exhibit with confidence</p> <p>Learn how to engage your audience, structure your ideas, and deliver a powerful presentation with clarity and impact!</p> <p>Lab materials included: Prop usage during presentation</p>	<p>Students will choose any topic from the above sessions covered and prepare a complete presentation of the same. Students will develop public speaking, presentation, and communication skills by delivering a structured presentation on topics covered so far. They will learn how to organize their thoughts, express ideas clearly, and engage an audience with confidence.</p>