AeroBay Curriculum <> GRADE 7		
Session No.	**Session Topic (Grade 7)**	**Objective**
Session 1	**Aero Explorer: Introduction to Aerospace** Step into the world of aerospace engineering and discover how airflows shape flight! Using a wind tunnel, test different airfoil designs and understand the principles of lift, drag, and aerodynamics. **Lab machinery included: Wind Tunnel and Sanding sticks** **Software included: AeroBay App**	Students will explore the fundamentals of aerodynamics by experimenting with different airfoil shapes in a wind tunnel. They will analyze how air pressure, airflow patterns, and design influence flight performance, gaining insights into real-world aerospace engineering.
Session 2	**Launcher Challenge: Build Your Own Disc Launcher** Get ready to engineer a high-flying disc launcher! In this exciting session, students will design and assemble a mechanical disc launcher using elastic potential energy, exploring how stored energy converts into motion. **Kit included: Disc Blaster (Take away)**	Students will understand the principles of elastic potential energy, force, and projectile motion by constructing and testing their own disc launcher. They will analyze how launch angle, tension, and force impact distance and accuracy, applying engineering concepts in a hands-on experiment.
Session 3-4	**Digital Creator: Design Your Own Product** Step into the world of digital design! Learn essential software skills to bring your product ideas to life, from 2D sketches to 3D models ready for prototyping. **Software included: Designing software -Sketchup**	Students will develop proficiency in design software, understanding key tools and techniques to create digital models. They will apply problem-solving and creativity to design functional products, preparing them for real-world engineering and innovation.
Session 5	**Shape & Create: Hands-on 3D Printing** Turn your imagination into reality! Explore the exciting world of 3D printing as you design, slice, and print your own 3D mode. **Lab machinery included: 3D Printer - Hands on by Trainer**	Students will understand the fundamentals of 3D printing, including design principles, material selection, and software. They will gain hands-on experience in creating 3D-printed objects, reinforcing concepts of precision, iteration, and prototyping in modern manufacturing.
Session 6	**Innovate & Print: Develop Your Own 3D Product** Transform your ideas into tangible creations! Learn to design and 3D print a unique product, bringing engineering and creativity together. **Lab machinery included: 3D Printer and PLA filament - Hands on by Student (3D printed product as take away)**	Students will develop 3D modeling skills, understand product design principles, and explore the role of additive manufacturing in modern industries. They will apply problem-solving and iteration techniques to refine their designs and produce a functional 3D-printed object.
	Aqua Navigator: Build Your Own RC Rowing Boat Set sail with science! In this exciting session, students will design and operate an RC-powered rowing boat, exploring the mechanics of propulsion and fluid dynamics. **Kit included: RC Rowing Boat (Student can take away any 1 between RC Rowing Boat and Titan Tank)**	Students will understand the principles of buoyancy, thrust, and mechanical motion by constructing and controlling a remote-controlled rowing boat. They will analyze how oar movement, water resistance, and motor efficiency impact the boat's speed and maneuverability.

Session 7-8	**Titan Strike: Build Your Own RC Tank** Command your own RC tank! In this hands-on session, students will construct and operate a remote-controlled Titan Tank, exploring the mechanics of tracked vehicles and motion control. **Kit included: Titan Tank (Student can take away any 1 between RC Rowing Boat and Titan Tank)**	Students will learn about torque, friction, and power transmission in tracked vehicles. They will explore how differential steering works, understand energy efficiency in motion, and analyze the impact of terrain on movement and stability.
Session 9	**Wings of Wonder: Exploring the Principles of Flight** Take to the skies as we uncover the science behind flight! In this interactive session, students will explore how lift, drag, thrust, and gravity work together to keep aircraft soaring. **Lab machinery included: RC Planes for demonstration**	Students will understand the four fundamental forces of flight—lift, weight, thrust, and drag—by engaging in hands-on experiments and model testing. They will analyze how wing shapes (airfoils) influence lift and discover how these principles apply to both nature and aviation.
Session 10-11	**Sky Architects: Design Your Air Model** Take to the skies with aerodynamics! Design and build your own air model while exploring the principles of flight, lift, and drag.	Students will understand the fundamentals of aerodynamics, experiment with wing shapes, and apply engineering concepts to create a functional air model.
Session 12	**Silent Soarer: Mastering the RC Glider** Experience the thrill of unpowered flight! In this hands-on session, students will build and pilot an RC glider, understanding how aerodynamics and control surfaces influence smooth and efficient flight. **Kit included: RC Glider (Take away)**	Students will learn how gliders stay aloft using lift and air currents, explore the role of control surfaces (rudder, elevators, and ailerons), and apply principles of flight such as lift, drag, thrust, and gravity in a real-world RC gliding experience.
Session 13-14	**Sky Engineer: Design and Develop Your Own Plane Model** Step into the shoes of an aerospace engineer! In this session, students will design and construct their own aircraft model, understanding the science behind flight and aerodynamics.	Students will explore the principles of aerodynamics, including lift, thrust, drag, and gravity. They will apply engineering design skills to create a functional plane model while understanding the importance of balance, weight distribution, and wing design in achieving stable flight.
Session 15	**Power Up: Electrify Your Plane!** Take your aircraft to the next level! In this session, students will integrate electronics into their plane model, adding power for controlled flight. **Lab materials included: Electronics tools included**	Students will learn the basics of electric propulsion, circuit connections, and motorized flight. They will explore how power sources, motors, and aerodynamics work together to enhance aircraft performance and stability.
Session 16-17	**Sky Sim: Master the Virtual Skies** Take control and fly like a pilot! Understand control surfaces, hand-eye coordination, and real-time flight mechanics as you navigate the virtual skies. **Software included: Simulation software** **Lab tools included: Transmitter, AA Batteries, Simulation cables**	Students will develop a practical understanding of flight control and aircraft maneuvering 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 18-19	**RC Takeoff: Pilot the Skies** 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. **Ground activity: Ground flying by trainer** **Lab tools included: 3D Plane, Transmitter and Caddy Box equipment (Anemometer, Battery Checker, Tools)**	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 20	**Ignite the Skies: Solid Propellant Rocket** Experience the power of real rocketry! In this session, students will build and launch a solid propellant rocket, understanding the science behind controlled combustion and thrust generation. **Kit included:Rocket (Group)** **Lab material included: Propellant and launcher**	Students will explore the principles of rocket propulsion, Newton's Third Law of Motion, and the role of fuel composition in achieving thrust. They will also analyze flight stability and safety considerations in rocket design.
Session 21-23	**Power in Motion: Hydraulic Excavator** Unleash the power of hydraulics! In this session, students will build and operate a hydraulic excavator, discovering how fluid pressure is used to lift and move heavy loads. **Kit included: Hydraulic Xplorer (Take away)**	Students will explore the principles of Pascal's Law, fluid mechanics, and mechanical advantage in hydraulic systems. They will also understand how hydraulic machinery is used in construction and engineering.
Session 24	**Spotlight: Exhibit with confidence** Learn how to engage your audience, structure your ideas, and deliver a powerful presentation with clarity and impact! **Lab materials included: Prop usage during presentation**	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.