

DAVINCI CHALLENGE

BUILD A DRONE WORKSHOP



KASHMIR WORLD FOUNDATION

The pervasive assumption surrounding STEM should not be "art versus science" or science in lieu of art, engineering should be where art meets science to facilitate true innovation. To galvanize creativity in engineering and sciences, KwF has a new challenge for young students: Build a Drone.

-Princess Aliyah Pandolfi



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Program Overview

KwF is dedicated to fostering student interest in autonomous aircraft technologies, crucial for economic prosperity and societal well-being. By merging computer science and aeronautical engineering, we seize cutting-edge opportunities.

Since 2014, the DaVinci Challenge: Build Drone workshops have engaged thousands of worldwide participants ranging from 8 to 80 years old. Through mission-driven challenges, the program provides comprehensive education, custom kits, and online resources, fostering collaboration among students, families, and experts.

These hands-on experiences cultivate critical thinking and problem-solving skills crucial for tackling real-world challenges. We aim to empower students to craft unmanned autonomous systems that address pressing societal needs.

Latest data from drone industry experts project the global drone market to reach US\$54.6 billion by 2030, with a 7.7% CAGR in the commercial segment.



Challenge Yourself

THE FOUNDATION

Since its inception in 2008, Kashmir World Foundation (KwF), a nonprofit organization headquartered in Great Falls, Virginia, has pioneered integrating education, science, and art to develop advanced technology solutions for wildlife conservation and protection. With a global network of partners and a legacy of hosting thousands of interns across various disciplines, including computer science, aerospace, artificial intelligence, art, game development, and more, KwF continues to inspire the next generation of tech leaders. Through collaborative efforts, KwF aims to address pressing real-world challenges and foster a sustainable future for wildlife and ecosystems worldwide.

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Kashmir Academy

At KwF, the Kashmir Academy hosts immersive workshops where participants explore the design and development of custom drones with AI technology for real-world applications.



Kashmir Robotics

Kashmir Robotics, KwF's SciTech division, drives innovation in wildlife conservation and counter-poaching efforts with advanced technology and expertise.

kashmir  rose

Kashmir Rose

Complementing these initiatives is Kashmir Rose, where eco-friendly treasures support artist communities and KwF's conservation endeavors.

Nature is the source of all true knowledge. She has her own logic, her own laws, she has no effect without cause nor invention without necessity. - Leonardo da Vinci (15 April 1452 – 2 May 1519)



The Workshop

DaVinci Challenge: Build a Drone Workshop was the first workshop developed by Kashmir Academy, aiming to encourage students of all ages to participate in an innovative and hands-on learning environment. The workshop teaches the basics of drone design, fabrication, robotic systems integration, 3D printing, and piloted and autonomous flying techniques in order to solve real world challenges, while simultaneously offering students a broader perspective on robotic aircrafts. The workshop incorporates all aspects of STEAM into comprehensive mission-focused materials, where students build a quadcopter or hexacopter that will later be used in the planning and execution of a project mission.

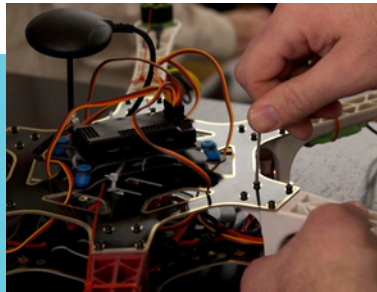
An essential part of the workshop students document their build and lectures through a written engineering build log, detailing what they observed, sketching the

components, and documenting technical issues and solutions. Each team also researches a flying creature to learn about aerodynamics and prepare a presentation which will include details on their flying creature's location, weight, wing span, speed, and unique flying capabilities. Guest speakers from multiple industries are invited to help give students first hand perspective of real world use of unmanned aerial systems.

All students who complete the Build a Drone Workshop receive a Drone Operator Certificate and become DaVinci Scholars with access to a large and growing community of drone design and coding experts collaborating on challenging applications.

OBJECTIVES

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BUILD A DRONE WORKSHOP



HANDS-ON WORKSHOP

Mechanics of Drones

In this hands-on workshop students will build, program, and learn to operate a fully autonomous drone. The workshop will help students understand the mechanics of a drone, how to integrate hardware and software before programming and calibrating the drone for flight tests.



FLIGHT TRAINING

Piloted & Autonomous Flight Tests

Train students on how to fly the drone manually and execute fully autonomous missions using Mission Planner software.



DRONE APPLICATIONS

Real World Projects

Students will learn about drone applications and discuss mission focused drone projects that integrate sensors and computer vision to solve real world problems.



ALL INCLUSIVE DRONE KITS

The DaVinci Challenge Drone Kits are integral to the workshop, designed for ease of assembly yet challenging in integration, calibration, and autonomous flight programming. Students are encouraged to build drones as a team. The all-inclusive Quadcopter or Hexacopter Drone Kits enable students to take their first flight. For autonomous flights, students need to use their own laptops or tablets.

INTRODUCTION	
01	Learn about Leonardo da Vinci's integration of STEAM observation of flying creatures to understand aerodynamics. Begin building drone with an engineering build log.

SAFETY AND GROUND TESTS	
03	FAA's Drone Rules & Regulations then begin ground station set up before the motor spin test. Troubleshoot as needed to prepare for Flight Day.

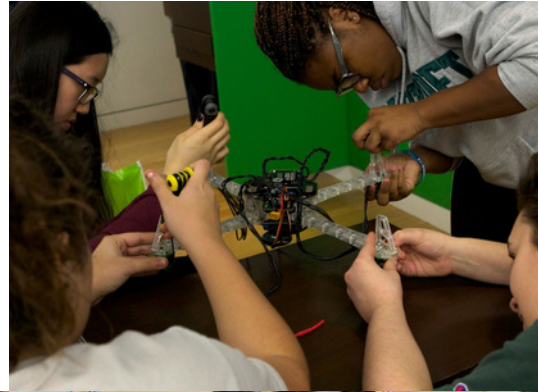
OPTIONAL	
05	The workshop can be customized to a 5 day workshop.

SCHEDULE

AVIONICS INTERGRATION	
02	KwF wildlife drone projects, history and future of drone applications. Complete avionics integration and Hardware Calibration.

FLIGHT DAY	
04	Safety check, piloted, and autonomous flight missions. Must present Engineer build log to receive Drone Operator Certificate at the Awards Ceremony.

WORKSHOP



01



02



02



03



03



04

Workshop Package Cost Breakdown



Quadcopter Drone Kit: \$795

- The DaVinci Challenge All-Inclusive Quadcopter Drone Kit is an essential part of the workshop package, providing students with hands-on experience in drone assembly and operation. Each kit includes:
 - Frame, motors, propellers, and electronic speed controllers (ESCs)
 - Flight controller, receiver, and transmitter
 - Battery and charger
 - Necessary hardware and tools
- This comprehensive kit ensures students have all the components they need to build and fly their own quadcopter drones.



Training Fee: \$400 per student

- The training fee covers a 4-day workshop led by KwF experts, including:
- Instruction on drone assembly, calibration, programming, and operation.
- Mission Planner software training for mission planning and automated flight.
- Students will learn to fly piloted and automated missions during flight day training.
- These training sessions provide students with comprehensive knowledge and hands-on experience, equipping them with the skills needed to succeed in the field of drone technology.

THE TEAM

**PRINCESS ALIYAH PANDOLFI**

Executive Director, KwF

Princess Aliyah chose a path to provide an interdisciplinary education and means to achieve real world solutions through a global network of scientists, researchers, academics, engineers and students. A pioneer in education, the Princess has created mission focused programs that integrate art, science, and technology as enablers for innovation and invention. She has engaged individuals, organizations, business leaders, universities and governments throughout the world in collaboration to protect endangered wildlife, the broader earth ecosystem, and the role of our planet in an evolving cosmology.

**KASHMIR ROSE PANDOLFI**

Jr. Scientist & Drone Engineer, KwF

Kashmir Rose Pandolfi is a Drone Engineer at KwF and has mentored at Teachers Take Flight and Fly for Conservation workshops. She has over five years of experience in building and operating custom aircraft. Kashmir has traveled to more than 35 countries to learn about wildlife conservation and how technology can be used to help protect endangered species through custom drones and robotic systems equipped with artificial intelligence. She has been invited as a guest speaker for many Girls in Technology events to inspire students in learning how integrating science, technology, engineering and math can help solve real world challenges for endangered species. When not working with KwF, Kashmir is a 5th grade homeschool student who enjoys mixed media visual arts, ice skating, piano, and playing with her friends.



DR. RONALD PANDOLFI

Director, Kashmir Robotics

Dr. Ronald Pandolfi has 30 years of experience in the application of surveillance, communications, robotics, aircraft and weapons systems to counter poaching of endangered species. As Founder and Director of the Technology Assisted Counter Poaching (TACP) network, he has been working behind the scenes for over 25 years equipping rangers and other ground forces with the tools needed to defeat poachers and the criminal organizations engaged in trafficking of endangered species.



ISHMAEL SHAKIR

DaVinci Challenge Instructor, KwF

Ishmael Shakir was born in Washington DC and grew up in Maryland. He has an Associate's Degree in Criminal Justice, a Bachelor's Degree in Political Science, and a Master's Degree in Digital Forensics & Cyber Investigations. As a hobby, he builds, troubleshoots, and operates different types of robotic systems. At Kashmir World Foundation (KwF), he supports the foundation's mission of education and project based learning. As a DaVinci Challenge: Build a Drone workshop Instructor, Ishmael helps students learn about the mechanics of drones and robotics systems integration of multi-copter platforms. With a background in Criminal Justice and Robotics, Ishmael focuses on how to combine his skills from the investigations field fused with robotics systems in support of KwF's Technology Assisted Counter Poaching (TACP) network to help protect endangered species worldwide.



SHAWN BRATHWAITE

DaVinci Challenge Mentor, KwF

Shawn Brathwaite was born and raised in Brooklyn, NY. He has a Bachelor's Degree in Criminal Justice and is currently pursuing a Master's Degree in Public Administration. Before joining the Kashmir World Foundation (KwF), Shawn was a caseworker for the Department of Correction in the state of Massachusetts. His role was to provide clients with the resources and tools they needed to be successful after completing their time in the Massachusetts prison system. At KwF, Shawn is an Small Unmanned Aerial Systems (sUAS) engineer, he assists students in the design, fabrication and operation of quadcopters. During his spare time, he volunteer's at different organizations to help underserved and underrepresented communities. Shawn is passionate about giving back while continuing to grow and evolve personally.

IN THE NEWS



CAN 3D-PRINTED DRONE SAVE WILDLIFE?

In 2013, Princess Aliyah Pandolfi launched Wildlife Conservation UAV Challenge (wcUAVc) to foster innovation and invention in the design, fabrication, and utilization of unmanned aircraft to assist with counter poaching and illicit wildlife trafficking. In just a few months, 180 teams in 45 countries, the wcUAVc became the world's largest and most distributed aircraft research effort. It called on students, hobbyists, and academics to cooperate in a design, build and fly challenge that emphasizes the integration of sensors, embedded systems, and communications in a robust and high endurance aircraft for counter poaching of endangered rhinos in South Africa.

Students Learn to Build a Drone Via
3D Printing

1

UAV124 DaVinci Challenge: Build
a Drone Workshop

2

Va. Students Learn to Construct
Drones in DaVinci Challenge
Workshop

3

Drones Playing an Illegal Role in
Wildlife Trafficking

4

Teachers Take Flight

5

MEDIA

**Contact**

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