

COACH CORNER: Best Practices for Success

Presented by:

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ROBOTICS EDUCATION &
COMPETITION FOUNDATION

SUMMIT

AERIAL DRONE PROGRAM



David Boe
Louisiana



Caitlin Hayes
Virginia



LTC (RET) Brendan McKiernan
Missouri



Nate Raynor
New Mexico

Aerial Drone Competition

Meet Our Panel

Time to hear from the COACHES!

Best Practices from David Boe



David Boe just completed his 35th year as an engineering teacher. He teaches in a rural school in central Louisiana. Mission 2026 will be David's fifth season as an Aerial Drone Competition coach.

Sample Practice Format

Coach Multiple Teams

Collaboration: Teams share ideas and strategies.

Mock Competitions: Allows in-house timed teamwork and skills runs.

Peer Learning: Students explain their approaches to each other and enjoy working together to prepare for competitions.

Cost Effective: One Team, including a field is about \$2300; to add an additional team, it costs \$450-800.

Build in Team Redundancy

5 students per team, 2 drones per team: piloting drone and programming drone

2 Pilots: 1 Teamwork Pilot and 1 Skills Pilot - are cross-trained to swap roles if needed.

1 Visual Observer: Visual observer doubles as a helper for programming skills (e.g., mat setup, repositioning).

2 Co-Programmers: Two programmers ensure continuity of thought and diverse debugging insight. They also learn the visual observer role.

Cross-Role Awareness: All team members are encouraged to understand each role's core responsibilities.

Set Goals and Recognize Accomplishments

Individual:

Each member sets a goal.

When a goal is met/exceeded, recognize the accomplishment and set a new goal.

Keep teams hungry

Compete as often as possible - every 2-4 weeks.

If there isn't a competition, find a team to scrimmage.

Start the Logbook Early

Begin the logbook **Day 1**— even before the first drone flight

Format: Google Docs

Importance: Learning Tool and considered for Judged Awards

Contributors: All team members create entries in the Logbook to show progression of ideas and highlight the iterative design process.

Great things don't just happen - they have gone through countless changes. Document it!

Get a Co-Coach: Share the Load

The work goes beyond teaching drone flight principles and programming.

- Team Registration
- Participant Release Forms
- Registering for Competitions
- Field Trip/Travel Requests
- Fundraising
- Team Shirts

A co-coach brings

- Backup when you're unavailable
- Additional skills and perspectives

Best Practices from Caitlin Hayes



Caitlin Hayes is a middle school science teacher and aerial drone team coach at St. John the Apostle Catholic School in Virginia Beach. As a DoD STEM Ambassador and Civil Air Patrol educator, she integrates hands-on STEM learning with real-world applications. Caitlin is passionate about empowering students—especially those new to drone education—by building their confidence through coding, piloting, and teamwork.

Sample Practice Format

Just Start

Don't wait until you feel like an expert. All you need are the drones—the rest will come. Your students will rise to the challenge, figure things out, and often teach *you* something along the way.

The key is to start.

Create a Team Culture

Establish routines, encourage leadership, and celebrate small wins. Give students roles and ownership early on. When they feel like they belong to something bigger, they'll invest more and push themselves further.

Normalize Trial and Error

Drones are the perfect tool for embracing failure as part of learning. Use flight debriefs and coding reflection time to **help students troubleshoot, analyze, and grow with each attempt.**

Connect It to Real Life

Tie drone work into science, math, engineering, and ethics. Whether it's calculating velocity, coding flight paths, or discussing drone use in society—**bring relevance to the work they're doing.**

Involve the Community

Bring in guest speakers, invite families to watch demo days, and showcase student projects. These moments create buy-in, build excitement, and reinforce that STEM learning is for *everyone*.

Best Practices from LTC McKiernan



LTC (RET) Brendan McKiernan is a retired Army officer and has served as an Army JROTC instructor for 14 years. He currently leads as the Senior Army Instructor for the Camden High School Laker Battalion. Under his guidance, the school's drone program—now in its third year—has qualified for and competed in regional and national championship events each year. The Laker team has earned national recognition annually, most recently winning the All-Service JROTC Teamwork Award and the All-Around Championship Award.

Sample Practice Format

Keep Teams Small and Purposeful

Smaller teams promote accountability, tighter communication, and stronger cohesion. When every Cadet has a clearly defined role and mission, it builds ownership and efficiency. Small units also allow for more individualized coaching and hands-on time with equipment, critical for skill development in both flying and technical roles.

Break the Game into Its Components

Instead of running full missions at every practice, we focus on isolating and improving specific skills. One day might be spent solely on precise takeoffs and landings, another on navigating an obstacle, and another on coding one part of autonomous flight. Mastering the parts makes the whole much stronger. This builds competence and confidence while also reducing burnout and frustration.

Include Interviews and Speaking Practice

Drone competitions include a judged interview component, and speaking clearly and confidently is part of being a leader. Regular mock interviews help Cadets/Students practice presenting their process, defending their choices, and showcasing their technical knowledge. These sessions prepare them not just for competition, but for future careers. Use the REC Foundation resources available

Keep Practices Efficient and Purposeful

Long, drawn-out practices don't necessarily lead to better results. We've found that focused, well-structured sessions, typically no more than 90-minutes keep Cadets/Students sharp and engaged. Overtraining leads to fatigue and mistakes, while high-energy, intentional practices lead to real progress.

Empower Cadets to Lead and Problem-Solve

One of the most important lessons we teach is ownership. When Cadets/Students are allowed to problem-solve, troubleshoot, and even fail occasionally, they learn more and take great pride in their achievements. Coaches should coach and guide, but the best teams are student-driven. Let them figure it out, and you'll see real leadership develop.

Best Practices from Nate Raynor



Nate Raynor is a dedicated STEM educator at Mescalero Apache School in New Mexico, where he teaches Physical Science, Biology, Chemistry, and Physics. He also oversees dual credit courses in Cybersecurity and Wind Energy. Widely recognized for his leadership and mentorship, Nate guides students in robotics through the VEX IQ and VEX V5 programs, and plays a key role in organizing and supporting Aerial Drone Competition signature events in the region.

Sample Practice Format

Hands-On, Problem-Based Learning

Include timed runs and competition style simulations.

Encourage students to use the iterative design thinking when problems arise.

Prioritize Safety and FAA Awareness

Guide students in developing a safety plan and organize safe practice areas.

Highlight FAA and Industry pathways including TRUST and Part 107 Certification

Build Culturally Relevant Connections

Collaborate with community members from diverse backgrounds.

Showcase role models including people from students' own communities or background.

Encourage Collaboration and Leadership

Let students lead the learning process.

Coach guides does, not command.

Align with STEM and Career Pathways

Connect students with STEM Professionals in person or virtually.

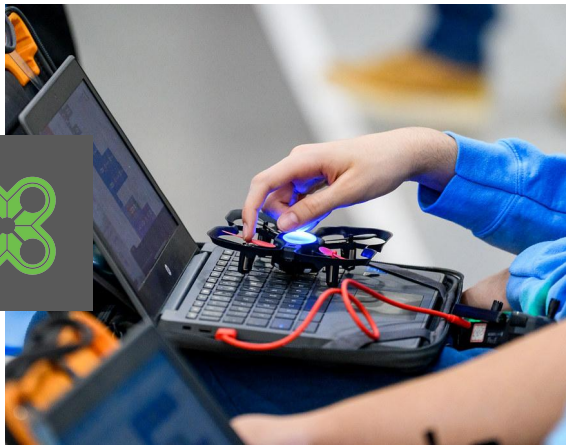
Encourage students to use the Competition Logbook to collect data and clear records.



Discussion: **Share your Tips and Resources**

Resources for Coaches

Aerial Drone Competition



Getting Started

- REC Foundation
 - Aerial Drone Competition
 - JROTC Teams
-

Coaches and Teams

- Training and Preparation
 - Team Support and Resources
 - RECEvents Help Center
-

Competitions

- Preparing for a Competition
- Aerial Drone Competition History
- Communications Mission
- Rankings, Qualifying Structure and Awards

Contact

We are here for you

If you need any further information about our drone program, one of our staff members will be able to assist you. You can contact us via email or phone, and our team will be happy to help. Additionally, you can visit our website for more details.

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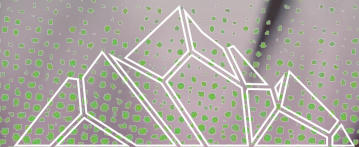
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Resources



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