FENWORKS

The Backbone of High-Tech Activities

Drone Program Practice Template

To ensure students are fully prepared for the regional tournament, Fenworks recommends a consistent and structured practice schedule. Fenworks recommends that schools have two - three hours of practice along with one hour of competition weekly. These practice sessions can be adjusted to meet the needs of your students and your school's available resources.

Daily Practice Schedule – 1 Hour Sessions

- **0:00 – 0:15 – Warm-up on Simulator**
  - **Objective**: Have students begin each practice session by warming up on the simulator.
  - **Activity**: Students should practice the designated "course of the week" or revisit and improve on previously assigned courses. The purpose is to build familiarity with the controls and boost confidence in navigating the course.
- **0:15 – 0:20 - Content Viewing**
  - **Objective**: Introduce a learning concept or skill enhancement for the session.
  - **Activity**: Watch the daily instructional video from the *Drone Racing Videos* resource provided by Fenworks. Each video is designed to target specific skills (e.g., navigating tight corners, controlling speed, or drone calibration). Encourage the students to pay attention to key takeaways and potential exercises they can attempt.
- **0:20 - 0:25 – Group Discussion & Clarification**
  - **Objective**: Engage students in a brief group discussion to reinforce concepts.
  - **Activity**: Discuss the video content as a group. Encourage students to ask questions about anything unclear or challenging. Use this time to clarify any key points and ensure they understand the day's objectives.
- **0:25 - 0:35 – Hands-on Practice in Simulator (Application)**
  - **Objective**: Translate learning into application.
  - **Activity**: Students practice the skills demonstrated in the video using the simulator. The simulator provides a no-risk environment for students to make mistakes and improve their control before attempting real-life flights. Focus on key aspects like smooth movements, accurate control, and strategic racing maneuvers.
- **0:35 – 0:50 – Real Flight Practice with Drone**
  - **Objective:** Transition to hands-on flying with real drones.
  - **Activity:** Using the drones, students get real-time flight experience based on the skills practiced in the simulator. Since several drones might be in the air simultaneously, this session emphasizes safe flying practices, spatial awareness, and following the designated course or objectives.
- **0:50 – 0:60 – Free fly time**
  - **Objective:** Allow students to explore and have fun.
  - **Activity:** Encourage students to enjoy some free-fly time. This helps build a love for drone racing and lets them explore creative flight techniques without the pressure of competition or strict objectives. This can be a great time for casual experimentation or personal challenge development.

Weekly Practice Focuses

New Students

Feel free to adapt these recommendations to suit your team's needs and goals. Successful drone racing requires both precision and practice, and this schedule aims to strike a balance between technical learning and hands-on experience.

- **Preseason – Week 2: Introduction to Controls and Simulator Practice**
  - Focus: For beginners, familiarize students with drone controls, which will initially feel unfamiliar. Emphasize understanding the basics and gaining comfort in handling the drones, particularly through simulator practice. Encourage them to learn the technical terms for all the drone equipment and maneuvers.
  - Objective: Establish foundational knowledge, getting a feel for steering, speed control, and basic navigation.
- **Weeks 3 & 4: Basic Flight Techniques**
  - Focus: Teach general flying techniques. Focus on stability, such as maintaining a steady hover, and begin introducing technical aspects of drone racing.
  - Objective: Ensure students can perform basic maneuvers and manage smooth takeoffs and landings, while exploring simple obstacles and racecourses within the simulator.
- **Weeks 5 & 6: Advanced Technical Flying**
  - Focus: Begin integrating more technical flying techniques, introducing more complex maneuvers and challenges like sharp turns, altitude changes, and speed control.
  - Objective: Transition more to real-life drone flights, while maintaining VelociDrone practice. These weeks should see marked improvement in precision and confidence.
- **Post Week 6: Tournament Preparation**
  - Focus: Prepare for competition by practicing the tournament courses. Provide practice time on courses that will be used in the tournament, focusing on perfecting racing lines, memorizing the course, minimizing mistakes, and improving overall speed.
  - Objective: Refine competitive skills, focusing on optimizing race times, handling pressure, and staying consistent through the race.

Returning/Intermediate Students

These practice focuses for returning or intermediate students are designed to challenge their abilities while honing the skills necessary for competitive drone racing. Each week builds on previous knowledge, ensuring continual growth and preparation for more advanced challenges in the tournament.

- **Preseason - Week 2: Refresher and Skill Reinforcement**
  - **Focus**: Begin with a refresher on basic drone controls, but with an emphasis on refining and enhancing previously learned skills. These weeks are about shaking off any rust from the off-season while reinforcing muscle memory and improving fluidity in movements.

  - **Objective**: Ensure students are comfortable with both simulators and real drones, focusing on executing smooth and precise movements. The goal is to bring them back to their highest operational level quickly.
  - **Skills to Practice**:
    - Quick transitions between maneuvers
    - Speed control and smooth turns
    - Performing consistent and precise hovering
    - Reducing reaction times to obstacles or course elements
- **Weeks 3 & 4: Advanced Maneuvering and Speed Control**
  - **Focus**: Focus on improving speed without sacrificing control. Introduce more advanced flight paths and maneuvering techniques, such as tighter turns, loops, and rapid ascents/descents, while balancing speed and precision.
  - **Objective**: Push students to fly more aggressively while maintaining stability. By the end of these weeks, students should demonstrate improved confidence in high-pressure situations and tighter control at faster speeds.
  - **Skills to Practice**:
    - Tight cornering at high speeds
    - Managing altitude changes in rapid succession
    - Speed runs through obstacle courses
    - Minimizing race time without sacrificing accuracy
- **Weeks 5 & 6: Competitive Flying and Strategy**
  - **Focus**: Transition into competitive racing scenarios. These weeks should center around race strategy, including when to push for speed versus when to focus on technical flying. Simulate race-day pressure with mock races and time trials.
  - **Objective**: Enhance tactical decision-making during races. Students should be able to recognize moments when they need to adjust speed, choose optimal racing lines, and navigate the course to maximize efficiency.
  - **Skills to Practice**:
    - Analyzing and choosing the fastest race lines
    - Strategic overtaking during mock races
    - Handling real-time race pressure and quick decision-making
    - Minimizing errors during time-trial challenges
- **Post Week 6: Tournament Prep and Course Familiarization**
  - **Focus**: These final weeks should focus entirely on preparing for the tournament. Use the actual or practice versions of the competition courses to familiarize students with the layout, challenges, and nuances of the specific tracks. Focus on perfecting individual performance and team cohesion, if applicable.
  - **Objective**: By the end of this period, students should be fully prepared for the tournament. They should feel confident in their ability to perform under pressure, handle tricky course elements, and race with consistent speed and precision.
  - **Skills to Practice**:
    - Mastering the tournament courses or similar layouts
    - Performing race simulations with minimal errors
    - Fine-tuning drones for optimal performance during the race
    - Achieving consistent lap times and maintaining high levels of focus during longer race sessions