# Robot Drone League (RDL) × National Standards Alignment & Crosswalk Guide

## For Educators and Program Leads

(For use in grades 9–12 Technology Education, Engineering, and Computer Science programs)

# ■ Overview

The Robot Drone League (RDL) immerses students and educators in robotics, drones, electronics, CAD, coding, cybersecurity, and engineering through a hands-on, challenge-based curriculum. This alignment guide maps the 2017 CSTA K–12 Computer Science Standards, ISTE Standards (2024), Standards for Technological and Engineering Literacy (ITEEA, 2020), Science & Engineering Practices (SEPs), and NGSS HS-ETS1 Engineering Design to the activities and deliverables outlined in the RDL manual. This guide helps educators, program leads, and school STEM teams ensure that student learning experiences meet high-value national standards while preparing students for 21st-century career pathways.

# ■ Standards Crosswalk

## ■■ Safety & Health

Standards Referenced: NGSS HS-ETS1-3; STEL Ethics & Responsibility; SEP: Engaging in Argument from Evidence
Skills: Tool safety, PPE use, hazard mitigation, ESD safety, ethical responsibility
RDL Manual Sections: Safety Overview; Lab Safety Rules; RDL Build Safety; Technical Documentation
Evidence: Safety checklists, labeled components, workspace setup diagrams, reflection in engineering notebooks

## ■ Electronics & Circuitry

Standards Referenced: CSTA 3A-AP-16 Debugging; STEL Systems Thinking; ISTE Empowered Learner; SEP: Using Mathematics & Computational Thinking
Skills: Circuit design, embedded systems, debugging, mathematical modeling
RDL Manual Sections: ECP Layout; Arduino Installation; Diagnostics Mode; PS/2 Controller
Evidence: Completed ECP diagrams, continuity test logs, Arduino code uploads, wiring documentation

## ■ Robotics & Mechanical Systems

Standards Referenced: NGSS HS-ETS1-1, HS-ETS1-2; STEL Design in Technology; SEP: Developing and Using Models
Skills: Chassis design, drivetrain mechanics, manipulator builds, design optimization
RDL Manual Sections: goBILDA Assembly; Manipulator Build; Starter Chassis; Robot Safety Inspection
Evidence: CAD exports, build logs, gear ratio calculations, scrimmage test results

## ■ Advanced Manufacturing

Standards Referenced: STEL Core Concept of Manufacturing; SEP: Planning & Carrying Out Investigations
Skills: CAD modeling, 3D printing, CNC prep, tolerance measurement
RDL Manual Sections: CAD & OnShape Design Lab; Laser Cut Panels; Additive Drone/Robot Components
Evidence: OnShape files, G-code logs, tolerance measurement sheets, manufactured panel exports

### ■ Computer Science Integration

Standards Referenced: CSTA 3A-AP-17, 3A-AP-22 Collaboration & Code Reuse; ISTE Computational Thinker; SEP: Analyzing & Interpreting Data
Skills: Algorithm design, collaborative programming, data visualization, model simulation
RDL Manual Sections: Arduino Programming; Drive Program Tracing; Drone FTW Code Challenges
Evidence: Arduino sketches with comments, pseudocode diagrams, debug logs, data visualization charts

### ■ Cybersecurity & Digital Fluency

Standards Referenced: CSTA 3A-NI-05 Cybersecurity Risks; ISTE Digital Citizen; STEL Ethics; SEP: Communicating Information
Skills: Cyber hygiene, secure coding, digital citizenship, ethical collaboration
RDL Manual Sections: FTW App Setup; Controller Network Security; Drone Code Storage; Secure File Sharing
Evidence: Authentication logs, secure coding reviews, incident response simulations, digital safety checklists

## ■ Credential Pathways Supported

OSHA-10 General Industry
FAA Part 107 (UAS knowledge prep)
NC3 – Precision Measurement
ETA – Basic Systems Technician
Alignment with STEL & ISTE certifications

## ■ Evidence Checklist

Engineering Notebook & Google Docs
CAD exports & design logs
Wiring schematics & ECP panel diagrams
Arduino/FTW source code with documentation
Drone flight logs & inspection sheets
Cybersecurity & digital collaboration plans