



NextWaveSTEM

## Mission-Based Robotics with Sphero RVR, Spike Prime, and Vex IQ

*Designed for learners in Grades 6-8*



### Course Description:

Robotics is all about solving real-world problems, and students are ready to engineer solutions today! In this course, student teams join the Rapid Response League and unlock new robot upgrades as they program robots to navigate, detect hazards, carry supplies, and complete missions, building confidence in coding, engineering design, and teamwork.

### Equipment, Curriculum, and Training Available:

- Classroom set of robots
- 15 Lesson Hours
- Curriculum and supporting materials
- Ongoing product and curriculum support
- Professional development
- Facilitation by a trained STEM instructor (optional)

### LESSONS



### LEARNING TARGET EXAMPLES

1: Robot Basics: Meet Your Robot	Identify key robot parts and explain what each part does.
2: Command Chain: Sequencing and Movement	Compare time-based vs distance-based movement.
3: Map Masters: Coordinates & Path Planning	Plan a route on a map to avoid hazards and reach a checkpoint.
4: Robot Tools: Attachments That Do Work	Prototype and build an attachment that can move supplies.
5: Interacting with the World: Sensors	Test a sensor and record readings at different thresholds.
6: Making Choices: Conditionals	Build an obstacle response using a sensor threshold.
7: Replay Mode: Loops	Create a repeating patrol that detects wildlife.
8: Robot Memory: Variables	Implement a counter to track mission performance.
9: Reusable Routines: Functions	Build a multi-step routine.
10: Stay on Course: Gyro/IMU for Accurate Turning	Explain heading and drift and how they affect accuracy.
11. Follow the Trail: Line Following and Edge Detection	Use sensor thresholds to avoid entering a restricted zone.
12: Measure Like a Pro: Encoders	Explain how encoders measure movement using wheel rotation.
13: Robot Reporters: Data Logging	Track performance metrics across multiple trials.
14: Mission Modes: State Machines	Build a multi-mode robot behavior.
15: Response League Finals: Capstone Challenge	Plan and build a strategy to complete the gauntlet.