M.O.T.O.R.

Oceana County's High School Students' FIRST Robotics Team #6128

Oceana County, Michigan









What is FIRST Robotics Competition

- FIRST For Inspiration and Recognition of Science and Technology
- A global robotics community preparing young people for the future
- Teams build leadership and teamwork skills while solving engineering challenges
- **3300** Teams of High school students, from over **100** countries with a passion for Technology, Robotics and Competition
- The Michigan district has 479 teams that compete in 26 events
- A weekend regional competition consists of **40** teams playing **96** matches
- Each match features 2 alliances of 3 teams in a 2:30 minute match
- **160** teams advance to the Michigan Championship **82** teams advance to FIRST Championship
- 620 teams from around the world compete at the FIRST Championship, 6 Michigan teams made it to the playoff round – Over 50K people attended



Who are the Hart M.O.T.O.R. Team

- Team of energetic School Students from Oceana County with a passion to design, build and program a competitive robot
- Team / competition structure provides opportunities for managing, recruiting, planning, budgeting, strategizing, documenting, promoting, procurement, building, testing, and competing as a team
- 2023 was a rebuilding season, team consisted of sophomores, freshmen, an 8th grader, two primary mentor/coaches, and a supportive group of parents
- Team meets in the fall for **skills** building activities, build season starts first Saturday in **January**, and competition is in March April
- The team's rookie season was 2016. **2024** will be the team's 9th season. Team size has varied between 6 and 14.
- The M.O.T.O.R. Team is the only active FRC team in Oceana County

Team Organization

Team Team Organization Building Identify Identify Leadership group Organize subsystem teams • Strategy; Drive; Procurement; Inventory; Documentation Organize Mechanical; Electrical; Software; CAD · Promotion; Awards; Community Outreach Identify Award submissions Machine Creativity Awards Award Team Attribute Awards Submitted Awards: Digital Animation; Safety Animation Robot Performance Awards



Robot Development Process

Team Design Process Tasks

- •Analyze challenge rules and scoring criteria, create strategy
- Identify robot motion requirements: agile; fast; reach; climb
- •Brainstorm & Prototype unique robot requirements
- •Analyze proposed solutions, plan robot subsystems
- Procure required materials and components
 Detailed Design: Mechanical; Electrical; Software
- •Construct robot subsystems and final assembly
- •Test robot under simulated competition environment
- Evaluate subsystem performance, repeat process to improve design
- •Take Robot to Competition

Implementation: Plan; Schedule; Track





Hart M.O.T.O.R. Team Goals & Needs

- To be successful in Robotic Competitions while learning sportsmanship, cooperation and fast on the spot problem solving
- Develop leadership, design and team building skills
- Develop long lasting friendships and working relationships with teammates, competitors and mentors
- M.O.T.O.R. Team Needs
 - Machine tools for component fabrication
 - Mechanical parts, actuators and raw stock
 - Electronic sensors, programming boards and computers
 - Motors, hoses, wiring, fasteners, and tools
 - Competition funds to support the team and expand their involvement in State and World Championship Competitions





Hart M.O.T.O.R. Team Robotics Lab Development

- Utilizing the Non-Profit Research Station's already established workshop for streamline conversion to new established Workspace
- Goal is an adequate space to work and develop competition robots
- Equip the lab with necessary components, tools, and electronics to execute Team Goals
- Utilizing enough space to make a mock competition area to test performance of developed robots.
- It is important that the workspace provides the infrastructure to support learning: Electrical Power; Internet Access; Convenient safe location
- Establishing an infrastructure centrally located to open team up to the entire Ocean County's High School level students



Hart M.O.T.O.R. Team Robotics Lab Wish List

•	1 Shop Sabre 23 - Quote # 005867-R0	\$15,040	•	2 Work Benches - Adjustable Height w/Drawers 52" Long	\$310
•	1 8100-1034 Mist Coolant	\$1,375	•	2 Common Hand Tools	\$100
•	1 8300-1015 Warning Light Bar	\$765	•	3 Refurbished Laptops for Electronics / Software Training & Dev	\$200
•	Lot Cutting Tools	\$300	•	3 Lab Kit Supplies	\$60
•	Lot T-Slot Clamps	\$100	•	1 3D Mouse for SolidWorks CAD Development	\$149
•	1 Air Compressor 2HP 7.4 CFM @100psi 115VAC	\$850	•	1 3D Printer Bambu Lab X1 Carbon, Capable to print Nylon, ABS	\$1,200
•	Lot Accessories	\$100	•	Lot Spare Parts	\$60
•	1 Drill Press Variable Speed 1/2" chuck- Wen	\$200	•	Lot Filament Selection	\$200
•	1 Vise	\$75	•	4 3-inch Max Swerve Drive Modules, Robot Parts	\$600
•	1 Drill Bits	\$250	•	1 1 Ton Arbor Press, 4" Height - Kaka AP-1	\$120
•	1 Parallels	\$50	•	1 Hantek DSO2DIO 100MHz Digital Oscilloscope	\$250
•	1 4" Bench Top Belt Sander- Wen	\$120	•	1 Horizontal Storage Rack	\$215
•	Supplies	\$50	•	1 20 Gallon Shop Vacuum	\$170

Wish List Total \$25,589



M.O.T.O.R. **Photo Gallery**





