Orenco
Tsunami

Team Assignments

Timekeepers - Penn, Carmen
Practice Table Schedulers - Vikram, Izabel
Team Marshals - Prithu, Vikram, Jackson
Equipment/Script Managers - Keala, Penn
Team Secretaries - Carmen, Izabel

Responsibilities

Timekeepers are responsible for keeping an eye on the time and making sure the team is where they are supposed to be. As a general rule of thumb you should be 5 minutes early for all your events.

Practice Table Schedulers are responsible for signing up for at least two sessions on the practice board. This task should be one of the first things we do after arriving at the pit.

Team Marshals are responsible for making sure the pit area stays organized. This includes making sure that computers are plugged in, batteries changed, equipment staged and protected.

Equipment / Script Managers are responsible for making sure they team brings everything they need for each event. A list of required equipment by event is below.

Team Secretaries are responsible for making sure the team introduction forms for robot judging, core value judging, and project judging are brought to each event. Secretaries are also responsible for recording team scores at the end of each robot run after they are posted.

Equipment Checklists

Project Judging

- [ ] Round Red Carpet
- [ ] SHED Logo
- [ ] Project Model
- [ ] Presentation Slides
- [ ] Easel
- [ ] Slide Remote Clicker Prop
- [ ] Shirts and Ties
- [ ] Project Judging Intro Sheet (handled by secretary)

Robot Judging

- [ ] Robot
- [ ] All Robot Attachments (x3)
- [ ] Copy of Code
- [ ] Robot Judging Intro Sheet (handled by secretary)

Core Values Judging

- [ ] Great attitudes!
- [ ] Core Values Poster
- [ ] Core Values Judging Intro Sheet (handled by secretary)

Robot Runs

- [ ] Robot (aligned and ready to run for first mission)
- [ ] Robot Attachments (x5)
- [ ] Jigs
- [ ] Easy Going Excitement

Team Schedule

Event	Time
7:45 AM	Team Check In
9:00 AM	Opening Ceremony
9:45 AM	Project Judging in Proj1
10:15 AM	Robot Design Judging in RD1
11:00 AM	Core Values Judging in CV1
11:10 AM	Snack in Cafeteria
11:50 AM	Robot Run 1 in Gym
12:26 PM	Robot Run 2 in Gym
12:40 PM	Lunch
1:16 PM	Robot Run 3 in Gym
3:00 - 4:00 PM	Tech Challenge and FIRST
3:15 - 4:00 PM	FLL Robot Elimination Game
4:00 - 5:15 PM	Award Ceremony

Frequently Asked Questions (FAQ)

Who did we present our project to? Who were our experts?
Elly O'Conner - Clean Water Services
Brianna Carl - Seattle City Light Hydroelectric Dam Tour Guide
Don Domes - FLL and Robotics Volunteer Expert
Sandy - Hillsboro School District
Mike Appel - Environmental Geologist
Parents, Teachers, Friends

What research did you do?
Besides speaking with local area experts about the ways in which we use water locally, we did a bunch of directed academic research (mostly on the web) regarding hydroelectric systems and power usage around the world. Once we had a project picked out we also ran some experiments to check the feasibility of our idea.

What does SHED stand for?
SHED is an acronym for Simple Hydro-Electric Dynamo. It's a play on words for our presentation. We took our inspiration from TED Talks. The name also represents what our project does!

What's a Dynamo?
The dictionary defines it as, "a machine for converting mechanical energy into electrical energy; a generator." It's what's at the heart of our project.

How much would a SHED setup cost?
A simple version would be about $220 US. But the design can be scaled up to meet larger demand.

Are there solutions similar to yours already in existence?
We learned form one of our experts (Mr. Domes) that an FLL team did something similar a few years ago but our solution is implemented a little differently and focuses on helping less advantaged people.

Can you tell me cool stuff about your team?
We're all 5th and 6th graders from Orenco Elementary school. Obviously we're really into technology and robots. And, we wrote a little song using the Core Values. Wanna hear it?

Robot Summary

Executive Summary

Our team's overall approach to our robot design was KISS - Keep it Simple and Sturdy. With minimal attachments to our robot we accomplished seven missions in total. To achieve this goal we programmed our robot with calculations for distance and also used the motors that were the most accurate to are team to drive straight lines .We used jigs to improve reliability and repeatability. To be productive, we split into sub groups to ''divide and conquer '' our work.

General Notes

Overall Approach
We installed a dog gear system with a modular harness to enable the team to switch attachments quickly.
We use the Mindstorms brick to run our programs.
We used a caster wheel for the rear of the robot to enable pivots.
We use the forklift to do fountain and Flower.
We used comments to makes code readable.
We changed from our touch sensor to ultrasonic sensor.
We tried the gyro Sensor.
We tried to minimize the times we come back to base.
We use a minimal number of jigs.
We return to base after push missions.
We modified the side brackets to allow access to the USB port.
We used sources like BuilderDude35 to get programming and mechanical ideas.

Programming

We used math blocks to program the robot.
We used Myblocks to organize our code.
We repurposed code for other missions.
We reused code blocks to make us more efficient. One example is the drive straight program using math blocks.
We used Myblocks to encapsulate the code.
We had contingency planning.
We changed the type of bricks to make the jig more secure.

Robot Kinematics
We used a curved turn to move ourselves to the flower.
Most of our attachments are actuated though we have two passive systems.
We currently use LEGO Mindstorms wheels though we considered LEGO motorcycle wheels.
We have three types of turns, pivot, right angle, and arcing turns.

Questions From FLL/ORTOP

Explain how the robot moves around the board and describe how the parts work together to make it move.
The team uses rotational sensors and math blocks to measure distances during navigation. We use the ultrasonic sensor to measure position for the Fountain, Flow, and Flower missions; we use jigs to position the robot in space.

How many attachments did your team build for your robot?
Five: one side guide for Flow mission; one actuated attachment for flow; one fixed pusher/ puller arm; one actuated fork; one fixed well dragger

How many and what type of sensors does your robot use?
2: Rotational Sensor; Ultrasonic Sensor

Did you program the robot using NXT(software with kit) or Robolab?
We used the Lego Mindstorms EV3 software.

How many programs are stored in the EV3 brick?
Four

How consistent are the programs (always successful, mostly successful, sometimes successful)
Mostly successful.

How many of the 18 missions can your robot attempt to complete?
Eight

Are there any features of your robot that you feel are special, different or clever?
Casters on the side to make the robot go smoother along the wall, well dragging attachment; push / pull arm