

Helpful Tips on Managing and Sustaining a FIRST Robotics Program

Team 359-Hawaiian Kids CMP Presentation Abstract

April 25, 2012 Workshop 6:00-7:00pm

Presented by: Glenn Lee, Lead Teacher, Mentor and Coordinator

Jandie Sabo-Documentation Student Leader 12th Grade

Megan Andrada-Documentation Student 8th Grade

Handout Materials: PowerPoint Outline, Program Outline, Sample STEM-Robotics Legislative Bills, 2011 Championship Chairman's Award Video (3 minutes), Sample NASA Grant Proposal Writeup, Sample Donation Letter/Thank You Letter


Description/Details of Workshop:


Team 359 – The Hawaiian Kids would like to do a PowerPoint and video presentation on *Program Management and Sustainability* for interested FIRST Robotics teams. Specifically, we would like to do a 1 hour Presentation, show our 3 minute 2011 Chairman's Award Video, describe the importance and impact of FIRST and the affected culture of our school community, provide handouts, and allow for questions at the end.

The approach would be to focus on how our program is established within the school, community and the partnerships established with businesses, sponsors, mentors, and government. Our team would share about our program history, including the many challenges that our team is faced with and how we address those issues with both short and long term goals. We have lots of meaningful experiences to share and how we were both successful and unsuccessful in addressing those specific challenges along the way. Fundraising ideas and sustainability will be discussed in detail, including links to possible funding sources for teams to explore. Past Hawaii legislative bills will be shared that lead up to State-wide support of the STEM and Robotics initiatives. In addition, interested teams will get to see several of our grant proposals, which will be dissected and discussed on how we were able to successfully receive support for our facilities, equipment and renovation efforts at our school.






In summary, the purpose of the presentation is to help teams address the most common challenges in managing and sustaining a FIRST Robotics program.

Helpful Tips on Managing and Sustaining A FIRST Robotics Program





Presented by: The Waiolua Robotics Team 359-Hawaiian Kids
Waiolua High & Intermediate School (Waiolua, HI)

.....

► Presented by:

- Glenn Lee
 - Robotics Teacher (1999-present) and Coordinator (2003-present)-CTE Industrial Technology Engineering Career Pathway, Waiolua High & Intermediate School(1994-Present).
 - Learning Center and Career Technology Education (CTE) Coordinator, Extended Learning Opportunity (ELO) Project Director, School Technology Cadre and Leadership Team.
 - B.S. in Electrical Engineering, minor in Math, M.B.A., Teaching Certificate in Secondary Education.

Who We Were.....

► Hawaiian Kids story---

- Rookie Year 2000
- Mentored by Team 254, the Cheesy Poofs
- 2 engineering mentors, 5 teachers, 1 coordinator
- Afterschool club only
- Sole funding sources-fundraising and donations
- Attended 1 regional in San Jose, CA-Silicon Valley Regional
- 18 students

Who We Are Today.....

Hawaiian Kids story---

Participation in its 12th Season in 13 years

Mentored Other Rookie Teams in the Past (Punahou Schools, Sacred Hearts Academy, Nanakuli H.S., Milliani H.S., Farrington H.S., Pearl City H.S., Nanakuli H.S., Waianae H.S. and many other HI teams)

- Collaborate with many FIRST Teams around the U.S. (W.I.N.C.)

Array of mentors, former students, teachers, parents, and other volunteers.

Program is part of our Industrial, Technology, and Engineering (ITE) and Arts & Communications Career (ACC) Pathways both during and afterschool.

Funding sources-fundraising, donations, partnerships, Title IV afterschool programs grant, ELO Grant, HP grant, CTE Carl Perkins and the Hawaii State Learning Center, Hawaii Legislative Funding-Act 111, Other various mini grants.

Consistently attend 3 regionals and 2 Championship Competitions (VEX and FRC).

25-35 students

Established FRC, FLI, and VEX programs/competitions under the "Waiolua Robotics Team."

****Robotics Course Sequence:**

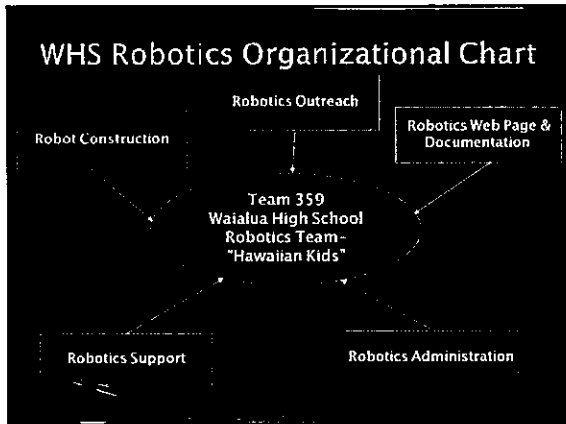
Documentation:
TAC2010 Arts/Communications Core
TAU2110 or TAG2210
TAK2930
TAK2990

Construction:
TIC5010 ITE Core
TIN5210,
TIK5930
TIK5900

Doc, John	8	TM0910	**Period	Lec	VEX Robotics
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****All participants below are currently active members of the Robotics Team.****

<ul style="list-style-type: none"> • Glenn Lee • Andy Cole • Mariana Asatur • Rebecca Bonner • Randolph Poma-Tong • Maggie Nuttall • Theodore Nagata • Joseph Gentry • Wesley Carter • Almond Gohar • Chris Tomblino • Adam Butac • Cody Smith • Malcolm Menor • Jefferson Iwano • Saurin Chell • Floyd Katsurumoto • Brian Wood • Melvin Mounuaga • Stuart Miharuru • Victoria Peracio • Junnie Sakamoto • Brett South • Myron Fuji-Myron's Travel Services • Jacobo He • Athlete - former students of our Program 	<ul style="list-style-type: none"> • Coordinator and Lead Teacher • Career & Technical Ed Teacher, Construction support • Univ. of Hawaii student Documentation support • Univ. of Hawaii student Documentation support • WHS Principal • Robotics Account Clerk • Community member support • Welding mentor • Graphic Design Mentor • Construction Mentor • Electronics Mentor, A.I. Lead Teacher • Engineering Support/Electronics, Control Systems, Fluid • Engineering Support/Mechatronics, CAD Design • Electronics Mentor • Architekt, CAD Mentor • Science Teacher, VEX Lead Teacher • Community member support • Computer engineering mentor, retired • Mechanical mentor, retired • Engineer mentor • Web Page Design mentor • Accounting, On/Offpage, O-ITP-Coordinator • Mech/and mechatronics coordinator • Team travel agency support • President, SOI (CPT) fiscal partner-WHS Foundation
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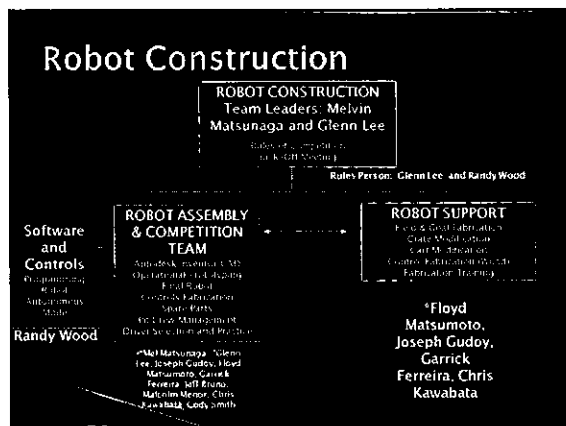


Robotics Administration

Team Leader: Glenn Lee

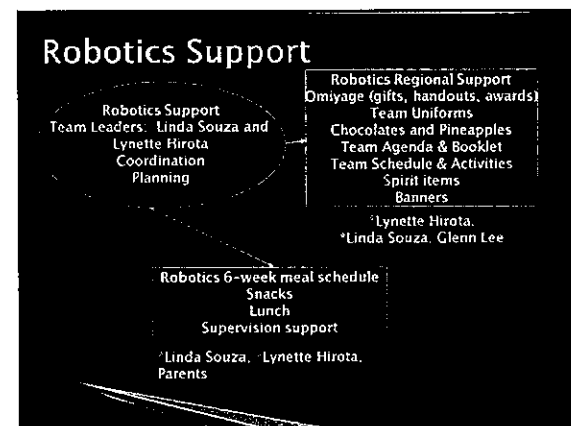
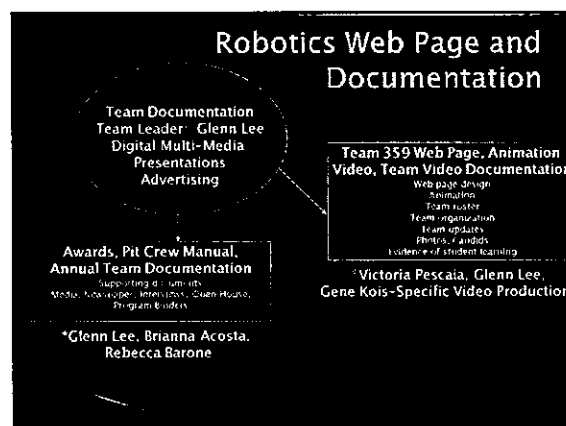
- Coordination
- Planning
- Finances
- Fundraising
- Class Setup
- Schedule
- Team meetings
- Purchase Orders
- Team Travel
- Grant & Financial Support

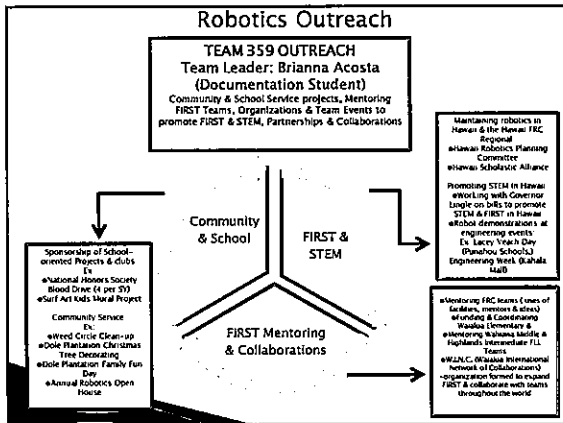
Glenn Lee, Marjorie Pudiquet, Myron Fujii, Lynette Hirota, Linda Souza



Work Flow

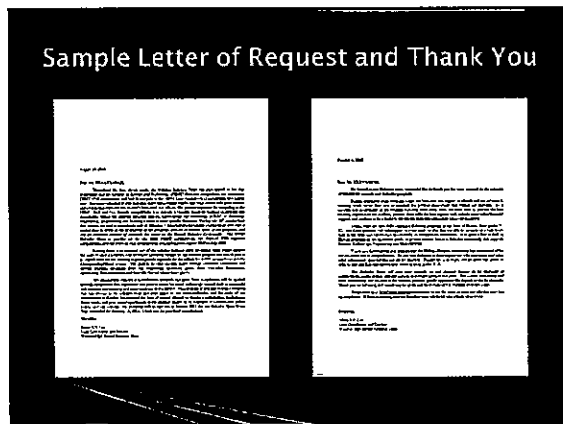
Week	Robot Assembly Tasks	Robot Support Tasks	Fabrication Training Tasks
1	<ul style="list-style-type: none"> Game & Parts Overview State the Challenge Brainstorming Select Robot Design Parameters Define Human Player & Other Team Functions 		
2	<ul style="list-style-type: none"> Prototyping, Drive/Chassis Fabrication & Subsystem Design 	<ul style="list-style-type: none"> Fabricate Field, Goals, etc. 	<ul style="list-style-type: none"> Mtl, Lathe, Cut Off Saw, Band Saw, etc. Familiarization
3	<ul style="list-style-type: none"> Subsystem Fabrication & Drive/Chassis Assembly 	<ul style="list-style-type: none"> Complete Field & Start Fabrication Training 	<ul style="list-style-type: none"> Continue As Time Permits
4	<ul style="list-style-type: none"> Drive/Chassis Testing & Subsystem Bench Testing Driver Practice 	<ul style="list-style-type: none"> Build Control (wood) & Cart 	<ul style="list-style-type: none"> Robot Parts & Continue As Time Permits
5	<ul style="list-style-type: none"> Subsystem Integration & Final Assembly Driver Practice 	<ul style="list-style-type: none"> Build Cage 	<ul style="list-style-type: none"> Robot & Spare Parts Fabrication Dead Time
6	<ul style="list-style-type: none"> Final Testing Driver Practice 		<ul style="list-style-type: none"> Spare Parts Fabrication Dead Time





A few ideas on How to Raise Funds to Support your Program

- Basic Fundraising. i.e. discount cards, bake sale, restaurant certificates, Krispy Kreme, etc.
- Donation. Write Letter of Request and Thank You if donation is made
- Partnership. Establish a relationship between you and a Potential Donor. Goods, services in exchange for funding and/or in-kind donations such as robot parts, labor, meals, etc.
- Grant Writing: Mini, Local, District, Statewide grants that serve a range of programs from robotics to bigger STEM initiatives.



Budget: Expenses, Fees, Hidden Cost

- Create a budget plan to meet the goals of participating in FIRST competitions.
 - i.e. Registration fees, travel, robot parts including spares, robot materials (metal, fasteners, playing field), team uniforms, tools, housing and meals if traveling to an event outside the State.
- Budget should include expenses to participate in team, outreach activities, and public events.
- Have contingency plans in case funding/facilities become an issue.
- Address sustainability issues for future events/seasons.
 - What about next season? What happens if your robot needs to be fixed after an event?

School Support

Student Body

- NOT just for nerds.
- Wide variety of skills needed. Spirit, writing, technology skills
- Diversity: we are about 50/50.
- Get older, more experienced students to teach the younger and new ones.

Faculty/Staff

- Get a great one with expertise that can contribute to your team functions.
- Multiple is good.

Showcasing Achievements

- Show off trophies/awards.
- Get on principals brag board.
- Showcase the robots, demonstration at assemblies, display in the library, Back to School, Open House, Town parades etc.

Lower Grade Levels

- Farm System FTC/FLL/JFLL
- FIRST is providing it, utilize it.

Raising Awareness in the Community

Brochures / Pamphlets

- Provide tangible source of information - not just words.

Fundraisers

- Look at it not just as an opportunity to make money, but a partnership to get the word out and provide a service to the community.

Display your "robot and your program"

- Bring robots to fundraisers, march in parades
- Build a World Class display booth

Work with other state departments -ex. DBEDT - for something that benefits the Innovation Initiative in Hawaii
 Mentors/Volunteers- don't turn down any assistance offered

Media

Interviews – Say “YES!”

- Students’ opportunity to shine
- Internet Publication
- Website

FIRST exposure

FIRST Hierarchy


- Woody, Dean & Dave
- Competition Staff
 - Be nice to Judges/Staff/Cuers
- Other Teams
 - Offer assistance
 - Collaborate and familiarize yourself with as much teams as possible
- Regional chapters
 - Hawaii FIRST Regional Planning Committee (HFRC)
 - Friends of Hawaii Robotics

Waialua Team 359 2011 – Waialua Robotics Team Championship Chairman’s Award Winning Video

A summary of our robotics program–present day.

Recap (from our perspective).....






- Managing a team involves the support of more than one or a few teachers.
 - Mentors, volunteers, and former students play a key role.
 - Having redundancy in support is a good thing.
- A team/school cannot sustain the costs of a FIRST Robotics program by fundraising alone.
 - Acquiring grants, establishing partnerships, and other sources of funding will help you reach your long-term goals.
- Establish a clear organizational structure and a student program of study.
 - Having clear goals, roles and responsibilities helps the team be successful.
- Be an active member of the FIRST Robotics community.
 - No team is an expert at everything. Solicit the help of other teams, sharing your knowledge base, and work to help everyone reach the highest success as possible.



359

The End

Waialua Robotics Team 359
Waialua High & Intermediate School (Waialua, HI)



1 

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WHS Robotics Organizational Chart

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Robot Construction

10  **Work Flow**11  **Robotics Web Page and Documentation**12  **Robotics Support**13 14  **A few ideas on How to Raise Funds to Support your Program**

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Waialua Robotics Team 359
Waialua High & Intermediate School (Waialua, HI)

August 10, 2010

Dear Ms. XXXXXXXXXXXX,

Throughout the past eleven years, the Waialua Robotics Team has participated in the *For Inspiration and Recognition in Science and Technology* (FIRST) Robotics competition, the Innovation FIRST VEX competition, and look to compete in the FIRST Lego League (FLL) competition this school year. Our team competed in past Regional and Championship FIRST and VEX events with great success and awards that represent our student's hard work and efforts. Our primary objective for competing in the FIRST, VEX and FLL Robotic competitions is to provide a valuable hands-on learning experience and opportunity, where our students integrate science, mathematics and technology (STEM) in designing, engineering, programming and building a robot to meet specific functions. *During our 10th anniversary last season, we had a remarkable run at winning 7 regional/championship tournaments and had a record year in terms of no. of students in the program, success in various areas of our program, and did an extensive amount of outreach for teams in the Hawaii Robotics Community. The WHIS Robotics Team is gearing up for the 2011 FIRST competitions, the 2010-11 VEX regional competitions, and the 2010-11 FLL competitions, scheduled from August 2010 to July 2011.*

Raising funds is an essential part of our robotics program since the school alone cannot support the costs of such a program. Our estimated operating budget for the robotics program this school year is \$110,000 since we are planning to participate in regionals for the FIRST/VEX/FLL competitions and the Championship/World events. Our goal is to raise enough funds through scheduled fundraisers and service projects; donations from our community members; grants from charitable foundations, sponsorship from businesses, and federally-funded school-level grants.

We respectfully request a contribution towards our goal. Your contribution will be applied towards competition fees; equipment and parts to create the robot; technology support such as computers and software; and shipping and travel expenses to the 2010-11 competitions. It will also sustain a program that has proven to be valuable time and time again to our students/faculty, and the pride of our communities in Waialua, Haleiwa and the State of Hawaii. Should we receive a contribution, the Robotics Team would add your name/organization to our sponsor banner to be displayed at competitions, public events, and our website. An invitation will be sent out in January 2011 for our *Robotics Open House Tour* scheduled for February 17, 2011. Thank you for your kind consideration.

Sincerely,

Glenn S.B. Lee
Lead Coordinator and Teacher
Waialua High School Robotics Team

October 6, 2010

Dear Ms. XXXXXXXXXX,

On behalf of our Robotics team, we would like to thank you for your support in the amount of \$20,000.00 towards our Robotics program.

Despite continued tough economic times, we have seen less support in schools and our program is working much harder than ever to maintain the positive experiences that impact our students. As a member and coordinator of the Waialua Robotics team since 1999, we have tried to provide the best learning experiences for students, provide them with the best support with outside mentorship/financial support, and continue to be a leader in the Hawaii Robotics community since our inception.

Today, there are now 400+ organized Robotics programs in the State of Hawaii from grades K-12. Our focus provides outreach/support to other teams so that they are able to compete at a high level, both in the State and nationally/internationally in competitions worldwide. It is quite a feat to look at Hawaii programs as not individual public or private schools, but as a Robotics community that supports Science, Technology, Engineering and Math (STEM).

Thank you for believing in a program that the Waialua/Haleiwa community has been proud of for our successes and accomplishments. *We are very fortunate to know supporters who appreciate and value what educational opportunities can do for students.* Despite the challenges, our program has grown to offer STEM and Robotics education to students from grades 7-12.

The Robotics Team will post your name(s) on our sponsor banner to be displayed at competitions, public events, and our website as a major sponsor this year. The school, community and most importantly, our students in the robotics program greatly appreciate the support given by sponsors. Thank you for believing and supporting our goals and the mission of the Waialua Robotics Team.

Please visit us at <http://www.waialuarobotics.com> to see the latest in what our robotics team has accomplished. If there is anything that our Robotics team can do for you, please let us know.

Sincerely,

Glenn S.B. Lee
Lead Coordinator and Teacher
Waialua High School Robotics Team



Science, Technology, Engineering and Math (STEM) in Action:

An In-Depth Look at How to Sustain a FIRST Robotics Program



Waiialua Robotics Team 359

Waiialua High & Intermediate School (Waiialua, HI)



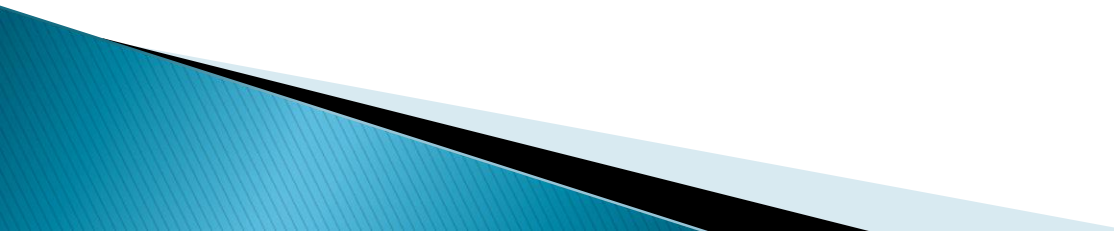
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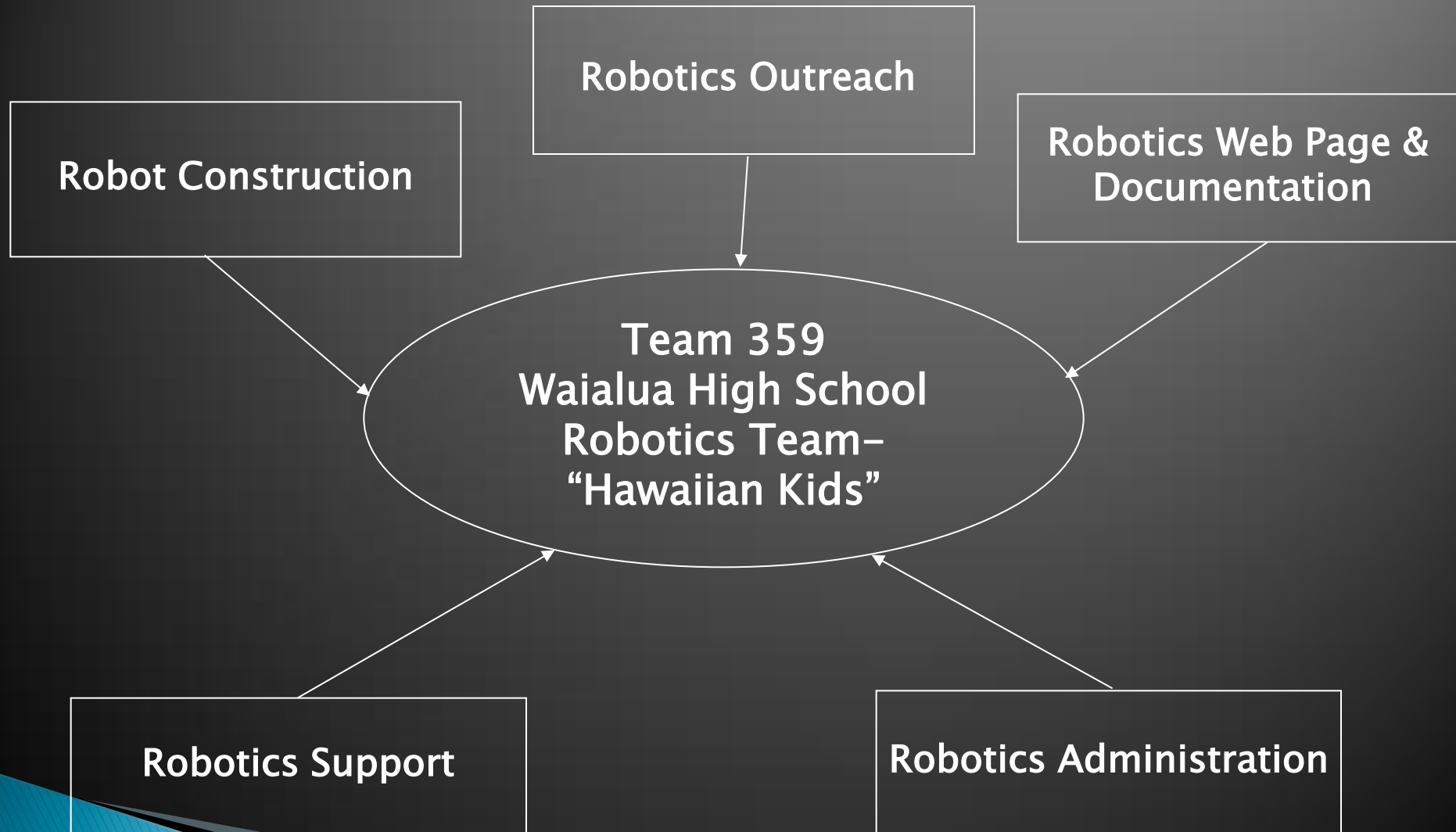
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Schedule
Team meetings
Purchase Orders
Team Travel
Grant & Financial Support

Glenn Lee, Marjorie Pudiquet, Myron Fujii, Lynette Hirota, Linda Souza

Robot Construction

ROBOT CONSTRUCTION
Team Leader: Mr. Melvin
Matsunaga

Rules of Competition
Kick-Off Meeting

Rules Person: Glenn Lee

**ROBOT ASSEMBLY
& COMPETITION
TEAM**

Autodesk Inventor CAD
Operational Prototype
Final Robot
Controls Fabrication
Spare Parts
Pit Crew
Driver Selection

•*Mel Matsunaga, Glenn
Lee, Joseph Gudoy, Floyd
Matsumoto, Garrick
Ferreira, Jeff Bruno,
Malcolm Menor, Randy
Wood, Stuart Nishimura,
Cody Smith, Adam Butac

ROBOT SUPPORT

Field & Goal Fabrication
Crate Modification
Cart Modification
Control Fabrication (Wood)
Fabrication Training

*Floyd
Matsumoto,
Joseph Gudoy,
Garrick
Ferreira,
Harold
Takemura

SOFTWARE

Programming
Robot
Autonomous
Mode

*Randy Wood

Work Flow

<u>Week</u>	<u>Robot Assembly Tasks</u>	<u>Robot Support Tasks</u>	<u>Fabrication Training Tasks</u>
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6	<ul style="list-style-type: none">• Final Testing• Driver Practice		<ul style="list-style-type: none">• Spare Parts Fabrication• Dead Time

Robotics Web Page and Documentation

Team Documentation
Team Leader: Glenn Lee
Digital Media
Multimedia Presentation
Open House

**Team 359 Web Page, Animation
Video, Team Video Documentary**

Web page design
Animation
Team roster
Team organization
Team updates
Photos, candid
Evidence of student learning

**Competition Awards, Mentor/Student
Awards, Pit Crew Manual,
Annual Team Documentation**

3 page document
Supporting documents
Media, newspaper, Interviews
McInerny Foundation
HP grant
Castle and Cooke

Brianna Acosta, *Glenn Lee

***Victoria Pescaia, Glenn Lee,
Gene Kois-Specific Video Productions**

Robotics Support

Robotics Support
Team Leader: Linda Souza
Coordination
Planning

Robotics Regional Support
Omiyagi
Team Uniforms
Chocolates and Pineapples
Team Agenda & Booklet
Team Schedule & Activities
Spirit items
Banners
*Lynette Hirota,
Linda Souza

Robotics 6-week meal schedule
Snacks
Lunch
Supervision support

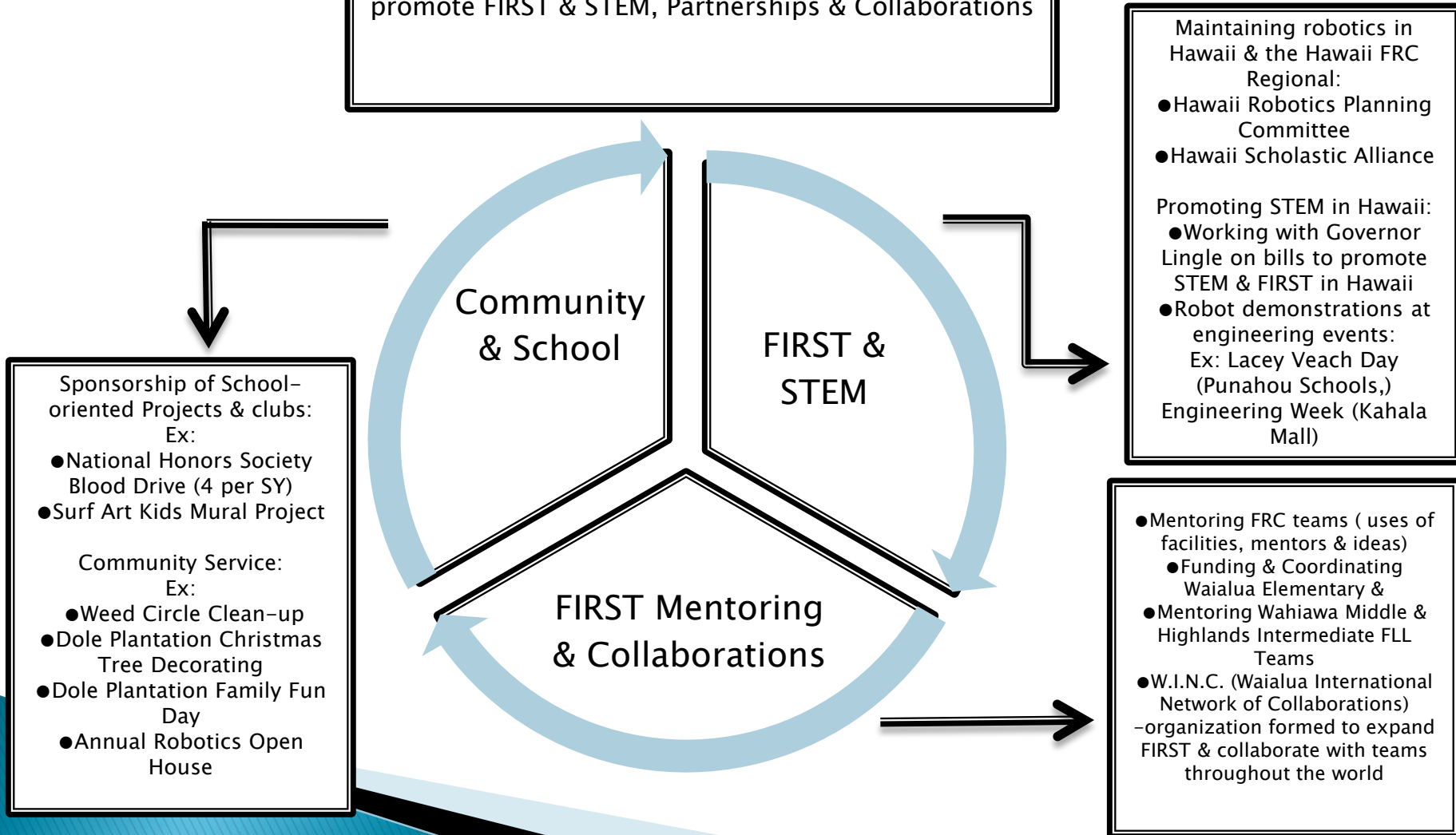
Chieko Lendio, *Linda Souza,
Lynette Hirota

Robotics Outreach

TEAM 359 OUTREACH

Team Leader: Glenn Lee

Community & School Service projects, Mentoring FIRST Teams, Organizations & Team Events to promote FIRST & STEM, Partnerships & Collaborations



Raising Awareness in the Community

Brochures / Pamphlets

- Provide tangible source of information – not just words.

Fundraisers

- Look at it not just as an opportunity to make money, but a partnership to get the word out and provide a service to the community.

Display your “robot and your program”

- bring robots to fundraisers, march in parades
- Build a World Class display booth

Work with other state departments – DBEDT – for something that benefits the Innovation Initiative in Hawaii

Mentors/Volunteers– don’t turn down any assistance offered

Waialua Robotics Team Program Video

A 3 minute clip of our 2011 Chairman's Award of our robotics program integrated within our school community, outside partnerships/businesses, and the Hawaii State DOE/Government.

Who We Are Today.....

Hawaiian Kids story---

- Completed 13th Season in 14 years
- Mentored Other Rookie Teams in the Past (Punahou Schools, Sacred Hearts Academy, Nanakuli H.S., Mililani H.S., Farrington H.S., Leilehua H.S., Pearl City H.S., Nanakuli H.S., Waianae H.S. and many other HI teams)
- Collaborate with many FIRST Teams around the U.S.
- 3 engineering mentors, 4 teachers, 5 university volunteers, 1 coordinator
- **Program is part of our Industrial, Technology, and Engineering (ITE) and Arts & Communications Career Pathways both during and afterschool.
- **Funding sources—fundraising, donations, partnerships, Title IV grant, HP grant, Perkins, State 15849, and the Learning Center, Hawaii Legislative Funding—Act 111**
- Attending 3–4 regionals and 1 Championship Competitions.
- 30 students on competition team, 120 students as part of a curriculum.
- Established FRC, FLL, and VEX programs/competitions under the “Waialua Robotics Team.”

Robotics Courses Sequence in alignment with the CTE Career Pathway:

•Arts/Communications (A&C) Career Pathway

TAC2010 A&C Core

TAU2110 Graphic Communications

TAN2110 Web Design

TAN2210 Animation

TAN2311 Gaming

TAU2210 Digital Media

•Industrial and Engineering Technology (IET) Career Pathway

TIC5010 IET Core

TIU5210 Metal Technology

TIU5310 Design Technology

TIU5620 Electronic Technology

TIU5810 Engineering Technology

Doe, John	8	TMG0410	8 th Period	Lee	VEX Robotics
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****All participants below are currently active members of the Robotics Team.****

•Glenn Lee	Coordinator and Lead Teacher
•Brianna Acosta*	Univ. of Hawaii student Documentation support
•Rebecca Barone*	Univ. of Hawaii student Documentation support
•Randiann Porras-Tang	WHIS Principal
•Marjorie Pudiquet	Robotics Account Clerk
•Theodore Nagata	Community member support
•Joseph Gudoy*	Welding mentor
•Wesley Carillo*	Graphic Design Mentor
•Armand Gahol*	Construction Mentor at Tournaments
•Chris Kawabata	Electronics Mentor,
•Kayla Van Matre	FLL Lead Teacher-Class Curriculum
•Adam Butac*	Engineering Support-Electronics, Control System, Paint
•Cody Smith*	Engineering Support-Machinist, CAD Design
•Malcolm Menor*	Electronics Mentor
•Jefferson Bruno	Machinist, CAD Mentor
•Sabina O'Neil	Science Teacher, VEX Lead Teacher-Class Curriculum
•Floyd Matsumoto	Community member support
•Randy Wood	Computer engineering mentor, retired
•Melvin Matsunaga	Machinist mentor, retired
•Stuart Nishimura	Engineer mentor
•Victoria Pescaia	Web Page Design mentor
•Deja Lunasco*	Web Page Design mentor
•Linda Souza	Accounting, Omiyage, Gifts-Coordinator
•Lynette Hirota	Meals and snacks coordinator
•Myron Fujii-Myron's Travel Services	Team travel agency support
•Jacob Ng	President, 501(c)(3) fiscal partner-WHIS Foundation

Asterisk – Former Students of our Program

Program Alignment with Current State Initiatives:

▶ Common Core Standards

- College and Career Readiness
- English Language Art (ELA) and Math Content Standards and Assessment
 - Our program Identifies Learning Targets and the Use of Assessment methods in the form of Constructed Response, Performance Assessment, Individual Communication and Portfolio Assessment.
- Shifts in ELA and Math Instruction
 - Shift 4–Text–based Answers in ELA and Shift 5–Applications in Math

Charlotte Danielson and Star Protocol

- Use of tools (daily planner) and Components of the 4 Domains to validate and improve teaching and student learning.

CTE Career Pathways and Programs of Study

- Arts & Communication
 - Occupational Clusters include: Graphic Design, Media Arts and Technologies, Broadcast Media.
- Industrial & Engineering Technology
 - Occupational Clusters include: Advanced Design & Engineering, Electronic Technology, Engineering Technology

Recap (from our perspective).....

- ▶ Managing a FRC Robotics Program involves the support of more than one or a few teachers.
 - Mentors, volunteers, and former students play a key role.
 - Having redundancy in support is a good thing.
- ▶ A team/school cannot sustain the costs of a FIRST Robotics program by fundraising alone.
 - **Acquiring grants, establishing partnerships, and other sources of funding will help you reach your long-term goals.**
- ▶ Participate in as many Outreach Events as possible.
- ▶ Establish a clear organizational structure.
 - Having clear goals, roles and responsibilities helps the team be successful.
 - Create a curriculum in your school that addresses common core standards, Hawaii State GLO's and workplace readiness skills.
 - A CLEAR organizational structure and Strategic Plan helps garner funding support.

Final Thoughts, Questions, Concerns?

- ▶ Q & A Period
- ▶ For more information about our program, please visit www.waialuarobotics.com.



The End

Waialua Robotics Team 359
Waialua High & Intermediate School (Waialua, HI)

