

Hawai'i 21CCLC Evaluation Report Template – SY2018-19 Cohort 10

OVERVIEW

To assist subgrantees with meeting state evaluation requirements, for SY2018-19 the HDOE is has created a standardized template for evaluations of the 21CCLC programs. Cohort 10 subgrantees are required to complete this template with SY2018-19 information. The checklist below serves as a list of required elements and provides a tracking tool for completion.

Evaluation Element	Complete?
1. General Information	<input type="checkbox"/>
Exhibit 1: Basic Information Table	<input type="checkbox"/>
Exhibit 2: Center Information Table	<input type="checkbox"/>
2. Executive Summary	<input type="checkbox"/>
3. Program Description	<input type="checkbox"/>
3.A. Program Description	<input type="checkbox"/>
3.B.1 Goals	<input type="checkbox"/>
3.B.2 Objectives	<input type="checkbox"/>
3C1. Attendance	
Exhibit 3: Students Served Summer 2018	<input type="checkbox"/>
Exhibit 4: Students Served School Year 2018/19	<input type="checkbox"/>
Exhibit 5: Students Served Summer 2019	
Exhibit 6: Students Served 2018/19 (Combined and Unduplicated)	
Attendance Discussion	
Exhibit 7: Characteristics of Students Served	<input type="checkbox"/>
Exhibit 8: Race/Ethnicity of Students Served	<input type="checkbox"/>
3.D. Programming	<input type="checkbox"/>
3.D.1 Activities Summer 2018	
3.D.2 Activities School Year 2018/19	
3.D.3 Activities Summer 2019	
3.E.1 Program Materials	<input type="checkbox"/>
3.E.2 Resources	<input type="checkbox"/>
3.F. Staff and Others Involved in the Program	<input type="checkbox"/>
Exhibit 9: Number of Staff by Position	<input type="checkbox"/>
Exhibit 10: Average Hours per Week by Position	<input type="checkbox"/>
Exhibit 11: Partners	<input type="checkbox"/>
Partnership Description	<input type="checkbox"/>
3.H. Parent/Family Involvement	<input type="checkbox"/>
4. Evaluation	<input type="checkbox"/>
4.A.1. Evaluation Design Overview	<input type="checkbox"/>
4.A.2. Implementation Evaluation	<input type="checkbox"/>
4.A.3. Outcomes Evaluation	<input type="checkbox"/>
4.B.1. Implementation of Evaluation Results	<input type="checkbox"/>
Exhibit 12: Performance on KPI Objective 1 – Turning in Homework and Classroom Participation	<input type="checkbox"/>

Evaluation Element	Complete?
Exhibit 13: Performance on KPI Objective 1 – Student Classroom Behavior	<input type="checkbox"/>
KPI Objective 1 Discussion	<input type="checkbox"/>
Exhibit 14: Performance on KPI Objective 2 – Core Educational Services	<input type="checkbox"/>
Core Educational Services	<input type="checkbox"/>
Exhibit 15: Performance on KPI Objective 2 – Enrichment Activities	<input type="checkbox"/>
4.B.3. Key Performance Indicators – Objective 2	<input type="checkbox"/>
Exhibit 16: Performance on KPI Objective 2 – Services to Parents and Family Members	<input type="checkbox"/>
Parent/Family Services	<input type="checkbox"/>
Exhibit 17: Performance on KPI Objective 2 – Hours per Week	<input type="checkbox"/>
Exhibit 18: Performance on KPI Objective 4 – Academic Improvement in Reading/Language Arts	<input type="checkbox"/>
Exhibit 19: Performance on KPI Objective 4 – Academic Improvement in Math	<input type="checkbox"/>
KPI Objective 4 Discussion	<input type="checkbox"/>
4.B.5. Achievement of Program-Specific Objectives	<input type="checkbox"/>
Exhibit 20: Progress on Program-Specific Objectives	<input type="checkbox"/>
Achievement of Program-Specific Objectives Discussion	<input type="checkbox"/>
4.C.1. Success Stories	<input type="checkbox"/>
4.C.2 Best Practices	<input type="checkbox"/>
4.C.3 Student, Teacher, Parent, Staff, or Community Input	<input type="checkbox"/>
4.C.4 Pictures	<input type="checkbox"/>
5. Sustainability Plan	<input type="checkbox"/>
5.A. Original Sustainability Plan	<input type="checkbox"/>
5.B. Updated Sustainability Plan	<input type="checkbox"/>
6. Conclusions and Recommendations	<input type="checkbox"/>
6.A. Conclusions	<input type="checkbox"/>
6.B. Recommendations	<input type="checkbox"/>
6.C. Evaluation Dissemination	<input type="checkbox"/>

1. General Information

Please retain the pre-set formatting of 12 pt. font for narrative sections of the report and 10 pt. in the tables throughout this document.

Exhibit 1: Basic Information Table

Required Information	Enter Information
Date Evaluation Report Submitted	8/15/2019
Grantee Name	Maui Economic Development Board
Program Director Name	Melinda White
Program Director Email	melinda@medb.org
Evaluator Name	Shawna J. Sodersten
Evaluator Email	shawnasodersten@gmail.com
Year of Grant	2018-2019

Exhibit 2: Center Information Table

Center	Name of Center	Grade Levels Served
Center 1	Maui Waena Intermediate	6, 7, 8
Center 2	Lahaina Intermediate	6, 7, 8
Center 3	Lokelani Intermediate	6, 7, 8
Center 4	Lanai High and Elementary	2, 3, 4, 5, 6, 7, 8
Center 5	Pukalani Elementary	K, 1, 2, 3, 4, 5

Moving forward, please enter the centers in the same order for the tables to come.

2. Executive Summary

This section of the report is a brief overview of the evaluation, explaining why it was conducted and listing its major conclusions and recommendations. Although the executive summary is placed first, it is typically the section that you write last.

Include a brief summary (no more than 2 pages, 12 pt.) of the key points from each section of the report:

- 1. Program description**
- 2. Evaluation Design**
- 3. Evaluation Results**
- 4. Conclusions and Recommendations**

STEMworks AFTERSchool™ is a multi-faceted, culturally aligned, hands-on program where students get to use the most current, high-end technologies applied to community service learning or engineering design projects. Students in STEMworks AFTERSchool are challenged to be self-directed, responsible individuals while developing the skills to navigate building collaborative team relationships. All activities are student centered, creating an environment where teachers become facilitators, navigating student learning through community based and culturally relevant projects that use technology to solve problems.

Each site has its own “STEM flavor” reflecting contractor expertise, local industry partners, K-12 grade-appropriate skill alignment, and a variety of industry aligned skills. STEMworks AFTERSchool program includes: Digital Media (Adobe Creative Suite Software for Movie Making, PSA, Digital Photography), Drone technologies (including circuitry, GIS & Digital Media), Coding (Programming for both Software and Hardware), VEX robotics, Computer Aided Design (CAD) (Including Autodesk Fusion 360 and TinkerCAD), Virtual Reality & Agriculture. By the end of the year 509 students had participated in STEM programming, including summer, fall and spring.

The program has procedures in place to document implementation by collecting data regarding program attendance, coordination and communication between in-school and after-school staff, contact and communication with parents, community outreach efforts, and curricula. The evaluation used data from survey instruments and both formal and informal observation tools, that gathered feedback from teachers, students, staff, parents, and community members regarding their experience of the program and its impacts; student performance in math, science, reading, and development in an array of core skills; student behavior; student perceptions and goals in STEM; and student development of leadership and teamwork skills.

The evaluation concludes that the program effectively engaged the intended participants and provided high-quality services supporting core subjects, including math, science and language arts. The program also provided an impressive array of high-quality, hands-on, technology-based enrichment activities. Now that the program has completed its fourth year, there is an appreciable benefit to the program deriving from experienced teachers, and also from experienced students who can function as mentors and elevate the overall sophistication of program offerings.

The program excels at involving community partners (private business; federal, state, and county government, institutions of higher learning) and generating in-kind donations of personnel hours or software.

Based on the self-reporting of students, program participants at all sites benefitted in a wide range of academic and job-readiness and life skills. The program is meeting or exceeding expectations for family engagement, improving student performance in the areas of classroom participation, homework completion, turning in homework on time, classroom behavior, and attendance. In all cases, a high percentage (minimally 88%) of attending students showed improvement in all four of these measured student-performance areas, with those attending the program for at least 30 days showing more improvement in behavior and attending class regularly.

In every participant school providing data, teachers report marked improvement in participants' school day performance in the core subjects of math and language arts. The available data (from teachers at 4 of the 5 sites)¹ shows program-wide impacts of improvement as follows: 75-100% math, 65-100% ELA. Within the population of students participating in MEDB programs, the achievement gap typically present between SED and non-SED students was overcome.

In addition to meeting or exceeding 21st CLCC standards for program success, the program met its self-created, program-specific objectives regarding teacher-assessed academic improvement, student interest in STEM careers, student perceptions of mastery of the engineering design process, and family participation and engagement. The program is still working towards meeting its program-specific objectives regarding student self-assessed academic improvement (met in math and in progress for other subjects), confidence in their abilities to complete tasks and achieve goals (goal of 90% currently at 70-86%); work well and collaborate with others on a team (goal of 90% currently at 80%).

It is recommended that the program:

- Continue to its successful methods of increasing the challenge/sophistication level of STEM offerings so that experienced students move beyond the initial skill-building orientation of prior years.
- Continue to experiment with the balance of program reach (number of students) and curriculum depth at programs where demand outstrips capacity.
- Continue to experiment with providing students more feedback on their improvement and to bring their self-assessments more into alignment teacher assessments (this evaluation process consistently indicates that students are under-estimating their improvement). Explore whether the issue is a culture of humility about self-reporting achievement.
- Strongly consider closing the program on Lanai (where another program is serving the same population) as participation numbers are unsustainably low despite considerable effort to engage students.
- Continue to implement its evaluation plan as structured, while taking the next year to review the evaluation plan and former reporting requirements and recommend any appropriate adjustments, with reports now being generated for and reviewed by the Project Director and MEDB board.
- Continue to provide summarized data from survey instruments from each site to all staff from the respective site during informal site visits so that this information can shape the program and its delivery,

¹ Much of the data released by iResults on August 2, 2019 was unusable as of the writing of this report as there were calculation glitches in the spreadsheets. Four out of five sites complied with the program directive to collect and provide back-up and cross-validation data via surveying teachers about participant grades and improvement.

including by further revising data collection instruments to best serve the goals of the program and the individual sites.

3. Program Description

3.A. PROGRAM DESCRIPTION

Provide a brief description of the program, including the following bullet points:

- ***Describe the organization operating the grant program.***
- ***Provide the grant year (i.e., Year 3, Year 4, Year 5, etc.).***
- ***Describe the community and schools involved in the program, including evidence that these are high-poverty communities.***
- ***Did the organization offer any afterschool programming prior to the grant? If so, when was such programming first offered?***

Describe the organization operating the grant program.

Established in 1982 as a private, not-for-profit 501(c) 3 organization, MEDB's mission is to provide leadership and vision in the community for the responsible design and development of a strong and diversified economy. The organization's priority focus has been to diversify Maui's economy by creating the requisite infrastructure to develop an innovation sector on Maui and within the state.

Creating and supporting a STEM pipeline from elementary school education through to employment is a central pillar MEDB's work, and MEDB has long held and actualized a commitment to fostering awareness of common needs, and facilitating collaboration and communication between tech employers, service providers, higher education, the workforce investment system, the school district system and associated institutions.

MEDB has been delivering STEM initiatives in an after-school format since 2000, including programming during intercessions and summer. MEDB programs for students have included offerings in computer programming, robotics, and engineering. MEDB develops original curriculum and professional development programming, including STEMworks™, the first service-learning program in the state. MEDB also developed Island Energy Inquiry™, the state's first original, place-based clean energy science interactive curriculum aligned with standards. MEDB also has a menu of career awareness building and job shadowing programs including Tech Careers: I am the Future™, Industry Connections, Tech Connect, Introduce a Girl to Engineering, mentoring, and a variety of internship programs.

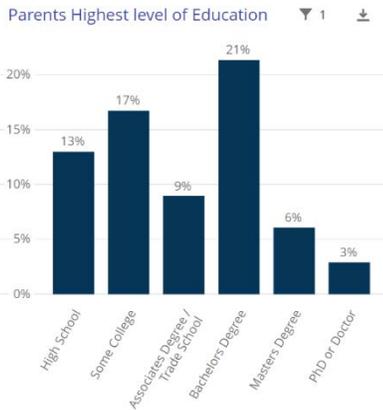
MEDB currently has 21 employees with projects spanning business development, conference services, and education and workforce development. The education and workforce development project reach includes serving over 200 schools and organizations statewide, 500 teachers and 40,000 students supported by an average annual budget of \$4 million – with \$2 million utilized for education/workforce. Funding sources include federal, state, county, and private funding.

Grant year: The 2018-2019 was year 4 of program. (Note: Grant award funding for 2014-2015 was delivered in the summer of 2015).

Describe the community and schools involved in the program, including evidence that these are high-poverty communities:

Risk factors present within the population of students attending the target intermediate and one elementary through high school (on Lanai) include English language-learning, low-income and low educational-attainment households. Data from the U.S. Census Bureau’s American FactFinder 2008-2012 American Community Survey 5-Year Estimates report indicates that, in all but one of these communities, fewer than half of the population has attained a Bachelor’s degree or higher, and in many cases, fewer than one quarter of the population has this degree of educational attainment.

Program participants in 2018-2019, with summer 2018, included 223 elementary school students (from Pukalani and Lanai High and Elementary) and 286 intermediate school students (Maui Waena, Lokelani, Lahaina Intermediate, Lanai High and Elementary). In total, the program reached 509 students at 5 schools.



The program surveyed students about their parent’s highest level of education and discovered that 13% of students had parents that only graduated from high school, and an additional 17% had taken some college courses, but did not obtain a degree. The program served a population of students where 39% grow up in households where students have the opportunity to be the first person to earn a 4-year college degree.

Specific Program Demographics (students in program) *Data from 21st CCLC CEB Offices

	Free/Reduced Price Lunch in program (% in program)	English Learner, ELL	Special Needs	Female	Male
Lahaina	16 (36%)	1	1	17	27
Lanai (LHES)	3 (20%)	0	3	9	7
Lokelani	42 (42%)	1	7	58	45
Maui Waena	21 (20%)	0	4	61	48
Pukalani	68 (42%)	4	7	80	85
Total	150 (35%)	6	31	225	212

- Did the organization offer any afterschool programming prior to the grant? If so, when was such programming first offered? MEDB has offered or supported afterschool, summer and school break programming in the areas of science, technology, engineering and math via robotics, STEMworks, and other initiatives since 2000 at various schools throughout the state.

3.B. PROGRAM GOALS AND OBJECTIVES

All Hawai’i 21st CCLC grant programs are accountable to the state’s Key Performance Indicators (KPIs) – see [Section 4B: Evaluation Results](#). In addition to these KPIs, subgrantees must articulate their own program-specific goals and objectives.

- **Goals** are brief, general statement about what the program hopes to achieve.
- **Objectives** are more detailed, specific statements that articulate exactly what will change as a result of the program.

- **Measures** must also be identified that will be used to assess progress toward *each* objective. Goals, objectives and measures should be clearly linked. See below for guidance.

3.B.1. Goals

What are the overall goals of your particular program? Please number each major goal. See example in grey. It is not necessary to have five goals, but space is provided in case you do.

1.	<i>GOALS</i>
1.	Program participants will achieve measurable improvement in Language Arts, Mathematics and Science.
2.	Program participants will develop interest in STEM education and careers, and an increased ability/practice in the engineering design process.
3.	Participants will show measurable improvement in self-efficacy, social skills, and ethical responsibility
4.	The families of program participants will engage in program activities and support the success of their children

3.B.2. Objectives: *What specific measurable objectives are being used to address your program’s goals? It is not necessary to have four objectives per goal, but space is provided just in case. Link objectives to the specific goals articulated above in section 3.B.1. See examples in grey below. Enter all that apply.*

Goal	Objective	Measure
1.	70% of students with room to improve will improve ELA, Math, and Science grades.	Teacher Grades
	70% of students will self-report improvement in ELA, Math and Science.	Student surveys
2.	80% of students express interest in STEM careers	Student surveys
	80% of students self-report use and mastery of elements of engineering design process	Student surveys
3.	90% of students express confidence in their abilities to complete tasks and achieve goals	Student surveys, Teacher Survey
	90% of students demonstrate an ability to work well and collaborate with others on a team, and develop of team-building and teamwork skills.	Student surveys, Teacher Surveys, Site Visit Observation Logs
	90% of students recognize and act on their role in building collaborative teams.	Student surveys
4.	70% of program families participate in at least one program activity.	Program attendance logs
	70% of families engage with student progress.	Parent Surveys, Student surveys

3.C. PARTICIPANTS INVOLVED IN THE PROGRAM

3.C.1. Attendance

Exhibit 3: Students Served in Summer 2018

Center	Summer 2018 Enrollment – Total	Grade Levels
Maui Waena Intermediate	40	Rising 6,7,8,9
Lahaina Intermediate	1	Rising 9
Lokelani Intermediate	26	Rising 6,7,8,9
Lanai High and Elementary	9	Rising 2, 5, 6, 7, 8

Pukalani Elementary	82	Rising 1, 2, 3,4, 5, 6
Subgrantee Total	158	Rising 2, 3, 4, 5, 6, 7, 8, 9

Exhibit 4: Students Served in School Year 2018-19 (fall and spring)

Center	2018-19 Enrollment – Total	2018 -19 Enrollment – Regular*	Grade Levels
Maui Waena Intermediate	109	81	6, 7, 8
Lahaina Intermediate	44	8	6, 7, 8
Lokelani Intermediate	103	40	6, 7, 8
Lanai High and Elementary	16	4	2, 3, 4, 5, 6, 7, 8
Pukalani Elementary	165	144	K, 1, 2, 3, 4, 5
Subgrantee Total	437	277	K, 1, 2, 3, 4, 5, 6, 7, 8

* Regular attendees are those who have attended the program for 30 or more days.

Exhibit 5: Students Served in Summer 2019 (ending June 30, 2019) Note- program did not use 21st CCLC funds for Summer 2019, refer to section on sustainability plans.

Center	Summer 2019 Enrollment – Total	Grade Levels
Maui Waena Intermediate	N/A	N/A
Lahaina Intermediate	N/A	N/A
Lokelani Intermediate	N/A	N/A
Lanai High and Elementary	N/A	N/A
Pukalani Elementary	N/A	N/A
Subgrantee Total	N/A	N/A

Exhibit 6: Total Students Served in 2018-19 (combined, unduplicated and includes summer)

Center	2018-19 Enrollment – Total	2018 -19 Enrollment – Regular*	Grade Levels
Maui Waena Intermediate	116	82	6,7,8, rising 9
Lahaina Intermediate	45	8	6,7,8, rising 9
Lokelani Intermediate	113	43	6,7,8, rising 9
Lanai High and Elementary	19	4	2, 3, 4, 5, 6, 7, 8
Pukalani Elementary	216	148	K, 1, 2, 3, 4, 5, rising 6
Subgrantee Total	509	285	K, 1,2,3,4,5,6,7,8, rising 9

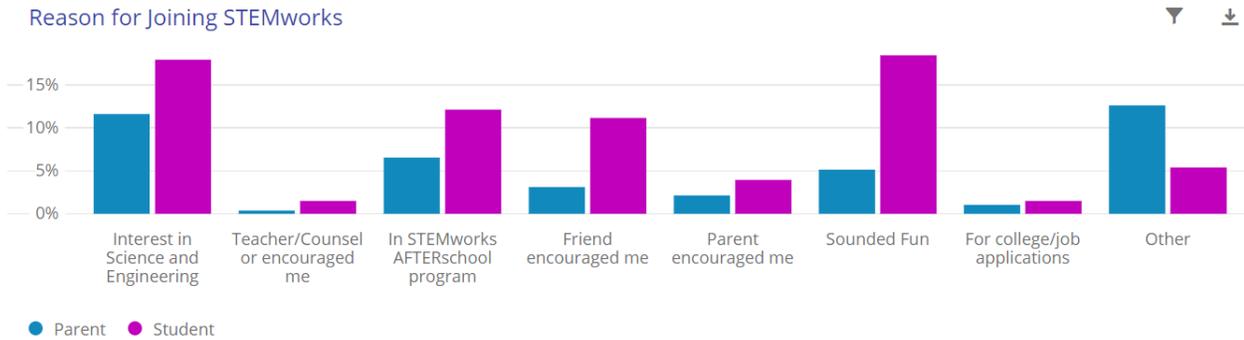
* Regular attendees are those who have attended the program for 30 or more days.

Attendance Discussion: Describe attendance at each center and at the subgrantee level. Do you have any challenges with attendance? How have you encouraged attendance?

Enrollment for 2018-2019 program started during the end of the 2018-2019 school year program, at the culminating parent nights. Summer program registration at Pukalani, Maui Waena, Lokelani and Lahaina included program waivers and registration for the 2018-2019 school year. Enrollment and interest surveys captured parent emails, so that program information, like daily schedules to encourage

attendance, were sent home. Summer open houses and beginning of school year open houses also included STEMworks booths with schedule information. Additionally, teachers sent flyers home with students (including the 2018-2019 schedule of program offerings).

The program surveyed parents and students when registering (Fall 2018), asking both to choose reasons for enrollment (both could choose multiple areas). Primarily, both parents and students were highly interested in the STEM activities offered, students especially thought the program sounded fun, were encouraged by friends, and enrolled because they had been in the program before. (Note- the 'Other' category mostly included needing afterschool care for their child).



In 2018-2019 the program sought to strike a balance between accepting as many students as possible and achieving a desired depth of impact with each participant. This schedule was easy to implement across all the middle school sites, but was more difficult with the elementary schools. The strategy was to achieve depth of study by offering more days of the same content area, but to reach more of the same group of students across each week. At the elementary level additional weekend camps were offered to students at the of the year. This offered more opportunities to learn skills in digital media and robotics, which were the most popular classes.

At Pukalani elementary it was not possible to offer every class to every grade level that was interested. Classes that were most popular, like Movie Making, expanded to serve more grade levels, 3rd, 4th and 5th) but could still only accommodate 16 students total. Thus, many students did not get their first choice and were waitlisted for classes. Students that were enrolled enjoyed the extra classes and multi-grade level offerings. However, some parents preferred a schedule with only 1-2 days a week of program and did not enroll their student as they had in previous years. Some students also did not want to try another area that was not their first choice, and did not re-enroll until the spring semester, when they were able to have their first choice of class. In culmination of the entire STEMworks AFTERSchool program for SY18-19, 437 students had participated in STEM programming with 277 students participating more than 30 days during Fall through Spring, and 285 participating more than 30 days from Summer, Spring and Fall.

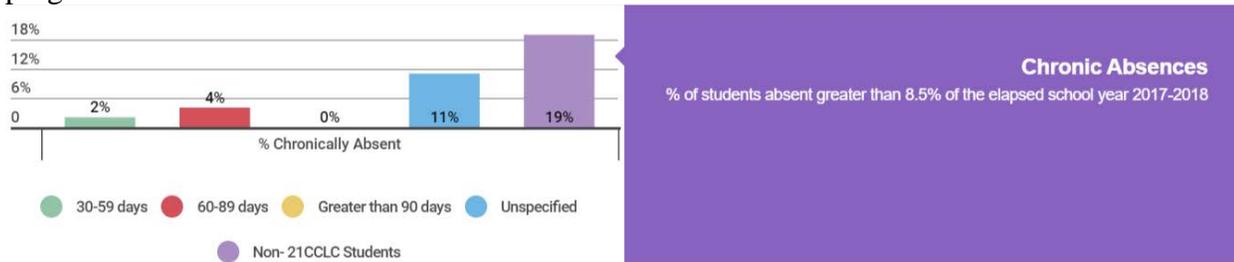
At Lokelani and Lahaina Intermediate, attendance was mostly consistent with the prior year. As usual, in the spring, competing activities (primarily sports) reduced attendance. At Lokelani, low enrollment led to the coding class being canceled, but hours were added to the robotics class which had many weekend hours due to their success in competition (making it to VEX Nationals and Worlds championships).

On Lanai, program attendance was low year-round. The site coordinator advertised in the local grocery stores, through emails to parents, and locally on Facebook. During the summer of 2018, STEMworks ran a two-day Movie Making camp prior to the start of the school year to excite students, while building skills. Through significant effort, including phone calls, flyers, and Facebook for the weeks leading up to the camp, nine students joined. All students were enrolled in the program and given flyers and schedules to share with friends. Of those students, three continued with the program, though all of them

continued to create movies during school hours. Previously, informal inquiries with students and parents revealed three factors impacting attendance: (1) students are in walking distance of home and the majority of students have obligations to watch younger siblings right after school, (2) many students are engaged in after school sports and fitness activities and (3) the school is also served by another 21st CCLC grant with competing activities. As the first two factors were present during prior program years, it is possible that the biggest driver of the low numbers is the creation of a second 21st CCLC grant program at the same school with a small island population. In a final attempt to support students, the site coordinator created a flexible schedule and added Thursday and Friday in the Spring (to the original Mon, Tues, Wed schedule). This was done to increase student hours, but also because a few students requested these days.

Site <i>*Note totals do not include summer.</i>	TOTAL Attending SY 16-17*	TOTAL Attending SY 17-18*	TOTAL Attending SY 18-19*
Maui Waena Inter	172 students, 120 adults	147 students, 125 adults	109 students, 101 adults
Pukalani Elem	230 students, 187 adults	123 students, 215 adults	165 students, 212 adults
Lahaina Inter	60 students, 15 adults	57 students, 18 adults	44 students, 19 adults
Lanai High and Elem	66 students, 26 adults	6 students, 5 adults	16 students, 8 adults
Lokelani Inter	157 students, 103 adults	131 students, 29 adults (note, total is estimated to be at least 30+ adults higher based on lost digital sign in data)	103 students, 59 adults
Total	685 students, 451 adults	464 students, 392 adults	437 students, 484 adults

Data from the HI DOE (Showing Spring 2018 iResults, since Spring 2019 iResults are not yet ready, <https://hidoe-ce.datadesign.io/>)². The program has found that students participating in MEDB STEMworks AFTERSchool programming have significantly better in-school attendance than non-participants. Many teachers across programs shared that the afterschool program was successfully used as a ‘carrot’ for students to earn higher grades and complete homework; students enjoyed attending the program.



3.C.2 Participant Characteristics:

What are the characteristics of program participants – use the following two tables to indicate for each site the characteristics of program participants including:

² Note: Spring 2019 iResults were initially made available to the program on August 2, 2019. However, a review of the data revealed significant calculation errors, rendering much of the data unusable for this report. WIT communicated with Mara Pike of the 21st Century administration, who confirmed there were glitches in the data summary. This issue was not resolved as of the completion of this report.

- F/R Lunch
- Special Needs
- English Language Learners
- Gender
- Race/ethnicity

Exhibit 7: Characteristics of Students Served (18/19 combined and unduplicated)

Center	F/R Lunch		Special Needs		ELL		Male		Female	
	#	%	#	%	#	%	#	%	#	%
Maui Waena Intermediate	21	20%	4	1%	0	0%	48	44%	61	56%
Lahaina Intermediate	16	36%	1	2%	1	2%	27	61%	17	39%
Lokelani Intermediate	42	42%	7	7%	1	1%	45	44%	58	56%
Lanai High and Elementary	3	19%	3	19%	0	0%	7	44%	9	56%
Pukalani Elementary	62	38%	7	4%	4	2%	85	52%	80	48%
Subgrantee Total	150	35%	31	7%	6	1%	212	49%	225	51%

Note: These data should match data reported in Exhibit 6.

Exhibit 8: Race/Ethnicity of Students Served (18/19 combined and unduplicated)

Center	#	%	#	%	#	%	#	%	#	%	#	%	#	%
	AI/AN	AI/AN	Asian	% Asian	NH/PI	NH/PI	Black	Black	Latino	Latino	White	White	2 +	2 +
Maui Waena Intermediate	0	0%	69	64%	5	5%	0	0%	11	11%	2	2%	21	20%
Lahaina Intermediate	0	0%	12	28%	10	23%	0	0%	8	19%	9	21%	5	12%
Lokelani Intermediate	0	0%	34	33%	8	8%	0	0%	14	14%	30	29%	16	16%
Lanai High & Elementary	0	0%	1	7%	2	14%	0	0%	2	14%	4	27%	6	40%
Pukalani Elementary	0	0%	25	16%	20	13%	1	1%	33	20%	30	19%	56	34%
Subgrantee Total	0	0%	141	33%	45	11%	1	1%	68	16%	0			

Note: AI/AN refers to American Indian/Alaska Natives; NH/PI refers to Native Hawaiian/Pacific Islander; 2+ refers to two or more races. Note: These data should match data reported in Exhibit 6.

3.D PROGRAMMING

Describe activities offered during summer 2018.

Summer 2018 Session: Summer session ran at Lokelani (included Lahaina student), Pukalani Elementary, Maui Waena and Lanai High and Elementary. In all, the program served 158 students across the five sites during summer 2019.

Lokelani ran full day camps for two weeks during summer reaching 26 Lokelani students plus one Lahaina Intermediate student. Students rotated through multiple STEM courses. In robotics students learned about VEX, and VEX IQ. Students were introduced to the robots in teams and worked on the design process and engineering robotics. They learned about the possibility of competing. In Videography, students took video and still pictures, added captions, and learned editing as they created presentations. In STEM Exploratory, students were given gmail accounts and learned how to sign onto the Google Classroom. They began digital citizenship lessons, and learned about their digital footprints, and cyber bullying. With CAD/Fusion 360, students attended a 2-day workshop on Fusion 360 (which also served one Lahaina intermediate student), which also covered possible careers. They designed their own 3D-printable rubber gaskets for the 3D printer. In Forensics, students learned about different types of fingerprints, and different methods of retrieving and analyzing them. They worked together to solve a mystery

using their fingerprinting skills. Note: Lahaina Intermediate students were polled for interest for summer session, of which 4 were interested, upon following up with parents, only 1 student was interested. Thus, program offered transportation to serve that one student to attend the Computer Aided Design camps with Lokelani students.

At Pukalani Elementary, five weeks of summer programming was offered to 82 students. The program invited the most at risk students, to support their needs in math, writing, and reading skills. The program was offered for a half day throughout the week and all students rotated through academic skill classes alongside STEM skills which included robotics, digital media and computer aided design with 3D printing.

Maui Waena's site offered 40 students five weeks of STEM camps, with full days. Each week was structured to explore specific STEM skills and projects. The summer opened with students focused on building mentorship skills with a videography project to be submitted to Hiki No or a SRL quality News story with a 10 shot sequence, short film, or PSA. The next week focused on Video Production which taught electronic component assembly, and critical thinking skills. Additionally, students learned about the content of their focus videos from professional mentor, J.D Armstrong, PhD to create an "Astronomy at The Speed Of Light" series. Another week focused on animation which taught students to think geometrically, and incorporated lessons on CAD design. The final week focused on robotics and engineering. Focusing on the STEM areas: build, design, and programming with coding. Student project activities in that week were mentored by Don Suzuki, a professional electrical engineer.

A full two days of summer camp were offered to Lanai High and Elementary students. The program focused on digital media and videography. Program students and teachers were interested in developing storyboarding and movie making skills. To build sustainability and interest, the program facilitator for digital media from Pukalani Elementary led 9 students and three teachers in the movie making process. Students created storyboards, learned how to properly handle technologies, and used editing software to create short films to be showcased during the first week of school.

Describe activities offered during school year 2018-19:

STEMworks AFTERSchool™ is a multi-faceted, culturally aligned, hands-on program where students get to use the most current, high-end technologies applied to community service learning or engineering design projects. Students in STEMworks AFTERSchool are challenged to be self-directed, responsible individuals while developing the skills to navigate building collaborative team relationships. All activities are student centered, creating an environment where teachers become facilitators, navigating student learning through community based and culturally relevant projects that use technology to solve problems.

Each site has its own "STEM flavor" reflecting contractor expertise, local industry partners as well as K-12 grade-appropriate skill alignment, and a variety of industry aligned skills. STEMworks AFTERSchool program includes: Digital Media (Adobe Creative Suite Software for Movie Making, PSA, Digital Photography), Drone technologies (including circuitry, GIS & Digital Media), Coding (Programming for both Software and Hardware), VEX robotics, Computer Aided Design (CAD) (Including Autodesk Fusion 360 and TinkerCAD), Virtual Reality & Agriculture. Each site began to notify students and parents during August about the STEMworks AFTERSchool program offerings. Each school reached students during the summer sessions and began fall program during August. The first semester (August to Dec) reached 373 students, with 131 having attended more than 30 days; in the previous year the program had 325 students attending during this semester. By the end of the year (not including summer) 437 students had attended with 277 reaching more than 30 days; in the previous year, 464 students had participated from August to May.

Each quarter, the sites engaged in STEM programming that was highly engaging and relevant for student interests as well as career exploration. Additional funding provided opportunities during Quarter 1.

Student Workshops were offered for students to increase skills and application of STEM:

August 18th, 2018 Fusion 360 at Lahaina Intermediate: Serving 11 students and three teachers, students had the opportunity to learn all about Autodesk Fusion 360, a 3D CAD modeling software that they can use to create models of something they'd like to later 3D print. They learned about fundamentals, such as how to start with

primitives (basic shapes) and use tools like sketch, extrude, fillet, chamfer and revolve to modify and customize them. Students created their own wax stamp design and got to use creative thinking and problem solving throughout the process, even learning new ways of creating simple designs, such as a star. Once students got a chance to learn about and practice using all these new skills, they worked on their own original designs, such as cups, paperweights, cars and boxes. Students employed the engineering design process as they continued to design, create, test and improve their 3D models. Lastly, students were tasked with thinking about how their new skills could serve a need in their community.

Sept 1 & 2, 2018 PlayCanvas (3D Game Design with Programming) at Maui Waena and Sept 15 & 16 at Lokelani: Two industry experts, Charlie Van Norman and Josh Bross, taught the students how to program and design a video game using PlayCanvas. The students were engaged and excited to learn. They learned skills such as: creating an object, adding collision and rigid bodies to objects to make them solid, camera angles and how to make the camera follow the player in the game, how code the character to throw an item, and texture mapping. Once the students learned a skill they quickly explored the software and tested out the new skill and built upon that to do more things. By the end of the 2-day session, the students were able to create their own 3D games in PlayCanvas.

Sept 8, 2018 Digital Storytelling with Film at Lokelani and Sept 15 at Pukalani Elem: Students learned the process of pre to post production for filming. They learned to use editing tools which included software such as iMovie and adobe for editing. Students storyboarded their scripts, acted and filmed. Working in teams, students created short PSA films and learned planning skills that were helpful during their afterschool classes. Site teachers were also invited to learn alongside students, to help build sustainability and competency among staff, several in-school teachers also joined the workshop to learn.

Sept 13, 2018 Junior Ranger Stewardship class at Pukalani visited Haleakala National Park and learned directly from the park ranger. Students hiked through a natural habitat and identified local species. The Ranger included lessons on adaptation and how to best protect native species. This experience provided more foundation for students to study how they could become stewards of their island.

Sept 29th & 30th Makey Makey at Pukalani Elementary: Serving 40 students and 2 teachers: Led by a certified Makey Makey educator, the students explored foundational skills in circuitry and coding by using a tool to prototype inventions. All students were successful in creating interactive inventions with switches and code. The workshops culminated with a parent showcase, where students guided parents through their process and shared their hands-on inventions. Two site teachers were also a part of the workshop, which helped build site sustainability and competency for the program's future.

On Sept 27 and 28th, 2018, teachers from across the state, including 14 STEMworks AFTERSchool facilitators, attended the 2017 STEMworks™ professional development, which locally provides training in project based and culturally aligned STEMworks™ methodology. This training focused on the engineering design process, and is aligned with a multitude of standards, including: NGSS, Common Core Math & Literacy, CTE, ISTE, and the Ha program. The workshops supported methodology to become facilitators of student centered service learning projects where students apply technology tools to solve an issue or problem in their communities using the engineering design process as a guide. Students attended breakout sessions with digital media virtual reality design software, circuitry prototyping, coding on the microbit, and design using After Effects. All teachers had opportunity to be a part of Q&A session with industry partners from local STEM industries in Hawaii, to best connect their student's skills with career pathways. The professional development furthermore engaged teachers in how to use Nepris to connect career mentors from Hawaii and across the US with their students, both during school and afterschool.

Quarter 1 2018

Lahaina Intermediate

STEM Variety

In August the school year started off with a meeting for the LIS instructors. They came up with a plan to focus on a different STEM activity together as a team every month. The first month the teachers focused on photoshop.

The students used different tools and their functions. They tested their new skills by creating a “Real or Fake” photo. The students also used Fusion 360 that they learned from a summer workshop to create their own 3D models. The students used a lot of measurement and geometry skills with Fusion 360.

In September, the focus was on the Engineering Design Process, VEX IQ Robotics and CAD for 3D printing using Tinkercad and Fusion 360. I worked with students on researching and designing a robot for the VEX IQ Challenge Next Level and worked on basic concepts, like drive base, power, mechanisms, etc. I also helped students as they practiced how to create a digital 3D model that could later be 3D printed. Some students got to print their designs and problem-solved issues that made it difficult to print. Students also invested fake money in the Stock Market and used math skills (basic operations, interest formulas, etc.) to decide what to buy and sell to maximize profits. Lastly, the students also participated in the NSA Cyber Security month.

Lanai High & Elementary School

In August, the students mostly focused on homework. The site coordinator focused on interacting with students and parents to be able to encourage enrollment and attendance to the program. She also worked to set up the classroom. The students also worked on doing more community projects. The students built Legos after completion of homework activities. The students also worked on the Hello week competition. Returning students reviewed the drone rules and parts lists.

In September, the site coordinator recruited students on campus as there are quite a few students after school with their parents who are teachers. Students have worked on homework, teamwork, and organization. Students did a design thinking lesson for the hello week contest. The students continue to start with homework before diving into STEM. Students explore Polygon Tiles, K'Nex, and Legos and how they fit together to make new shapes and creations.

Maui Waena Intermediate

Digital Media & Robotics: The students worked on Photoshop, Final Cut, and After Effects. The students also learned how to use camera equipment such as gimbal. The students also learned how to teach other people in editing and the steps on how to use the equipment. The students also worked on their interviewing skills, script planning, and shooting. They learned to work in groups and divide the workload by skills and interests. The students also participated in a Maui regional VEX tournament on Sept. 22. Lastly, they also prepared for a STEM Exploration community event that the students present, teach and host.

Engineering, CAD, & 3D Printing: The students and instructor reviewed the expectations, principles, and practices for the program. The returning students continued to work on Fusion 360, Adobe Illustrator, and Inkscape projects. The returning students also mentored new students. The students also researched and implemented an alternate control of BoXZY laser engraver using an open source Inkscape vector graphics program and free extensions.

Computer Science: Students used a modern Arduino board to revitalize an old electronic lock box toy. We experimented with video feedback and captured video for B roll in film projects. The students also worked with mCookie components to make an audio activated alarm system. Students also designed a control circuit with an Arduino to control an LED strip by decoding the IR signal to the strips remote control. The students also worked on assembling drones and adapting the CC3D flight controller to control a car type. The students also worked on a software simulator and practiced flying with a trainer cable system.

Pukalani Elementary

The site coordinator helped to set up the program for the semester by attending the parent night, assisting parents to sign up for the program, contacted parents, and created attendance sheets. The students had a busy month of September where students participated in a Makey Makey workshop, attended a VEX IQ robotics competition, and a parent open house. In the weekend Makey Makey workshop, the students learned about open and closed circuits, conductors, insulators, and switches. They used their bodies to create closed circuits to make things happen on the computer, they played the bongos and piano as well. The students also used fruit and vegetables to

discover that their water content makes them good conductors. The older students used Scratch to make a voting machine.

For the open house on September 19th, parents were invited to tour all extracurricular activities that students have the opportunity to take part in. The following parts of the STEMworks program were exhibited: 3 D Printing, Graphic Design, Gr. 1/2 robotics, Stem Imagineers Robotics Team, Science Olympiad, Math Matters team. They had over 80 families stop in for a visit.

STEM Exploration Gr 1-2: The students learned the term “command” for robotics by playing such games as Simon says and twister. The students also learned the term “code”. The students used Dash and coding to turn him into animals and vehicles. The students also used Dot to code and play the game hot potato.

The students worked together in teams using Osmo through coding, numbers, and words. The students learned basic geometry degrees and angles by having students blindfolded and verbally directed by peers through a maze. Transitioned exercise to dash, having students program dash to follow a maze using coding.

Coding & Robotics Gr 2-3: In August, the students collaborated with partners to use simple code to program Beebots to reach targets. They also practiced in code.org. Worked to learn from mistakes as one student had a “meltdown” due to a mistake. The students also used the Ozmos to code through a maze.

In September, the students continued to learn how to program Beebots with more efficient coding. They worked together in teams and participated in a friendly competition. Older students researched the best design for their aquaponics system. They considered different factors such as types of fish, plants, and lighting.

Let’s Code and Invent Gr 3-4: In August, the students explored using the Little Bits Star Wars kits. They worked together to build the robot and operate it. They also worked with snap circuits. They followed instructions to build circuits and experimented with how energy flowed.

In September, the students worked in two different groups to differentiate the skill levels. Group one worked in SCRATCH learning coding and incorporating videos. The other group worked with Snap Connects, building closed circuits with switches, sounds, lights and fans. Kids work in groups of 2s to collaborate. At the end of the session, students share and present their completed task. Students are expected to disassemble, organize and show respect for equipment by cleaning up and putting equipment back in order.

Graphic Design Gr 3-5: In August, the students began by drawing by hand to learn basic shapes to create more complex shapes. Then the students learned Inkscape, a vector, and design process

In September, in graphic design the students are familiar with basic tools. They worked on 3 projects they can work on: a shirt design, stickers, and Halloween cards. In 3D Printing the students are familiar with basic tools in TinkerCAD. The students also worked on printing a new gasket for the 3D printer.

Stewards of Hawaii: Junior Rangers Gr 3-4: In August, the students read about the creation of an island and the type of volcano that created Haleakala. They researched the difference between Native and Non-Native Hawaiian plants and animals.

In September, the students were able to enjoy their field trip to Haleakala. They were able to apply their knowledge of endangered and extinct animals. They were asked questions on the content learned from the classroom. They were able to connect the pictures of these animals with the environment. Students then reflected and thanked the Ranger in a reflection sheet completed in class.

Movie Making Gr 3-5: In August, the students learned the basic structure and stages of production. The students got to use the iPads with filming. The students also practiced the art of interviewing someone and skills it takes to get a successful feature.

In September, students are worked on a short film called "Hawaiian Cinderella". Students also created their first two weekly broadcasts that included storyboarding, scriptwriting, videography and editing.

Photoshop Gr 4-5: In August, the students started their first project using the engineering design process. They gathered and brainstormed their ideas using color blocks. The students also learned to support and help each other, this helped them to learn teamwork. The students presented their projects to the class.

In the month of September, the students completed 2 projects. The students worked on "shapes-to-objects" where they created and brainstormed 4 creatures, objects, and/or foods they enjoy. With this project, the students had to learn how to problem solve. They had to ask themselves "how can I make this object look like the real thing." The second project they completed was "autumn garden". The students learned about the importance of creating a new layer in Photoshop.

Advanced Robotics Gr 4-5: Worked to improve their robots. The students also learned about specializing in jobs based on personal strengths. The students reviewed the engineering design process. They created an Engineering Design notebook and worked together to rotate between the different jobs, e.g., note taker, leader, and organizer of parts. The students also participated in driver tryouts and learned about observing to identify problems and determine solutions.

The students participated in 3-day tryouts for new students. In the tryouts the students participated in teams to accomplish tasks such as learning names of parts, scavenger hunt for parts, and usage of parts. They also built a robot where they communicated, made a plan, and cooperated. A final team was selected and practices were held. The team practiced building a starter robot, practiced driving skills, and began their engineering design process notebooks.

In September, the students entered in the VEX IQ Maui League scrimmage on September 22. Pukalani STEM Imagineers had two teams who competed. The Red team designed a robot using compound gears and a 4-bar lift that would be able to lift the robot on the bar. The yellow team designed a robot using a double motor and a 3 bar lift to get the yellow hub and stack it. Here is a link to our Engineering Design Journal (working document that documents our daily meetings and sessions):

https://docs.google.com/document/d/1kdtQGIwO1jXjxxVq5ta5Cs4XRbg5Zmp_8E3bP079_tU/edit

The teams came in 1st and 2nd place with the two highest averages in the teamwork challenge and 1st and 3rd in driver skills and programming.

Lokelani Intermediate

The site coordinator helped to start up the program for the site with 6 classes and 4 new STEM teachers. The teachers met and discussed goals and expectations. The site coordinator also observed classes and offered support with supplies and software including Arduino with computer science, Lynda.com and TinkerCAD with 3D printing. The first parent night was held and helped with inputting waivers and survey information.

Robotics & More! The program got off to a good start with high student enrollment from the 6th grade. The VEX team 5777K traveled to East Oahu and won the Sportsmanship award and placed 3rd overall. The Maui VEX IA league planned an event and the Girl Powered event was set for October.

In September, 18 students attended a field trip to AMOS, where the students were introduced to Aerospace. The instructor also organized and led the Maui VEX competition on September 22. On September 29th, the students participated in the 2018 VEX Island Pacific Academy Tournament. They placed 8th overall. The instructor also attended the 2018 STEMworks professional development on Oahu.

Forensic Math Counts: In August, the students practiced the warm-up and workout for Math Counts and discussed problem-solving skills. In September, they continued to practice the past competition and do the warm-up. They focused on problem solving-skills and communicating reasoning.

Agriculture: In August, the students organized the plant nursery, quarantined plants contaminated with pests, weeded pots, checked irrigation (installed prior to summer break), and discussed upcoming FFA events and projects to focus on this year. Students inspected worm bins and harvested worm castings and worms. Students also discussed fundraising ideas to help members get to Oahu for the upcoming FFA State convention.

In September, new members were oriented to FFA operations and school ground Ag facilities. Students did internet research regarding Papaya fruit production in Hawaii (using credible online sources) then each shared their research, and propagated/planted Papaya seeds. Students harvested the last remaining worm castings and worms from last year's worm bins to get worm bins ready for this year. Students collaborated on which projects to further pursue: Added succulent bonsai production and Lokelani FFA movie/documentary productions to the list. Students mixed soil (using proportions) then did succulent propagation via cuttings in the nursery.

Photography/Digital Media: In August, there was a slow start to the program due to storms. The few students that were enrolled learned the basic camera care skills, asking for permission to take photos of others and their work. They learned the “Rules of Thirds” and where to find it on devices and cameras. The students and instructor also created an Instagram account to document their photos.

In September, students learned their "Menu" options, discussed photography terms and phrases (DSLR vs "fixed lens" cameras, ISO, WB, exposure, view finder vs "live view," etc.), and worked on developing "an eye" for lines and textures in shots. Students documented their progress via Instagram, as well as created a folder on Google Drive (link below) to share and look at each other's photos.

Let's Create! CAD & 3D Printing- This class did not start till September. In September, the students completed their STEMworks after school surveys. They were also introduced to TinkerCAD and Fusion360 softwares. They also utilized Lynda.com for CAD and 3D printing tutorials and videos. Students practiced presentation skills and shared their designs. They explored other design communities and looked at sustainable, ethical and practical uses of 3D printed designs.

Let's Code: In September, the students worked with the Microduino Kit 3. They also worked with Hopscotch, Scratch, and Spheros. Students complete homework for the first 20-30 minutes. Then they worked on Coding from kits or on the web. The Microduino kit is interesting but very difficult to work with. The Spheros were engaging because they could use them right out of the box. Students made a course on the floor and worked on coding the Spheros to go through it.

Q2 SY 18-19 (October-December)

Lahaina Intermediate:

The LIS STEMworks AFTERSchool program offers STEM variety, where different areas of focus are introduced to the students.

STEM Variety: In October, the instructors discussed what they learned from the professional development meeting on Oahu. The month was spent learning photography principles such as depth of field, shutter speed, and ISO. Students learned different techniques to use when taking photos and learned about using various features of the camera. They finished the month learning how to create a virtual tour of the school campus by taking pictures with a 360 camera and using the YouVisit website to create a virtual tour. The students also continued to work on the engineering design process using VEX Robotics, and worked to program Microbits using blocks and some students even tried a bit of Python.

In November, the students used the engineering design process to improve their robots for an upcoming VEX IQ tournament. The students also created virtual reality experiences with a 360 camera to create a virtual tour of the school. They used Photoshop to create a flyer for their virtual reality tour and to create holiday cards. The students learned how to use Text-to-tip to create posters.

Instructors also helped students complete some math assignments that focused on solving equations and linear functions. Instructors worked on a presentation that showcased the STEMworks AFTERSchool program for the LIS Open House. The students also prepared for the open house by displaying their work and demonstrated the robots that they created. The site coordinator provided input on annual report, processing new waivers, pick-up/delivery of snacks and program items.

In December, the students worked on Robotics skills and the focus was to use the Engineering Design Process to modify their existing robots. They designed and built new mechanisms to add to their robots and worked out problems dealing with structural integrity. They watched videos from the first competition and brainstormed about possible improvements. They then deconstructed their robots and rebuilt them based on their observations and feedback from the players. Some students also began programming their robots to run autonomously. Students also spent time this month doing various Hour of Code activities, learning about Blocks and other programming languages. Students designed a holiday card with an LED light that would be off when closed and turn on when opened. Students had to learn and apply circuitry skills to be successful.

Lanai High & Elementary School

STEM Exploratory and THINKits: In October, the students explored Little Bits from THINKit kits and observed what happens when parts are connected different orders. Students also built a Haunted House and learned a little about how to keep the structure from falling apart.

In November, the students completed homework on a daily basis. They also used Khan Academy to learn about different math skills. The students focused the month of November on learning how to program Spheros. They also used virtual reality glasses to tour monuments and national parks, and worked on the Say Hello National Project against bullying. Students also built a haunted house by first designing on paper then building with cardboard.

In December, the students started code.org and scratch.edu. We charged Spheros to get them ready for coding and races/challenges. Students also got to know and use Scratch and learn maintenance for the iPad. They helped do software updates and organize apps on the iPad.

sUAS/Drones: Teacher was out on medical leave; area was not focused on in November or December.

Maui Waena Intermediate

Digital Media & Robotics: In October, the instructors continued to help students better their skills in videography as well as editing. They worked on their scripts and storytelling. The instructors worked with the students to strengthen their story ideas.

In November, the students worked on writing scripts and determining audience, purpose, and message for PSAs. They also continued to work on their presentation skills as they prepared for STEM exploration day. They also worked on technical skills in editing and graphics. Students were encouraged to stretch to new levels with their project choices, and more experienced students taught their classmates skills in Final Cut and After Effects, editing and camera skills. Students received feedback on their scripts.

In December, students prepared for 2 STEM Exploration days, wrote and planned hosting segments for Hiki No, and continued work on motion graphics and PSAs for Olelo. Students were guided to stay on track with their projects and continued work such as editing a video, taking photos, learning the camera, etc.

Engineering, CAD, & 3D Printing: The students with experience in this area continued to work on Fusion 360, Adobe Illustrator, and Inkscape projects. The students with experience guided students with less experience in the different software. The students also prepared demonstrations for STEM day activities. The students used mathematics, material science, physics, critical thinking, problem solving, perseverance, resilience, and collaboration to complete these tasks.

The students assembled a drone kit to flying status. They also continued simulation in flying practice. The students experimented by attaching a micro camera to VEXIQ robots for an FPV mode of driving and controlling the unit.

Computer Science: In October, the students organized the Adafruit parts into groups (Feather parts, small parts and connectors, robot parts, cricket parts). They also continued building traditional drone kits and made a stop motion movie with actors and drawings. Students learned about different type of drone batteries and flew micro drones with and without FPV video.

In November the students worked with the new Microduino kit. It uses Scratch to interface the program with the Microduino to respond to the IR remote control.

In December, they continued practicing flying drones with the dual transmitter trainer system. Students also disassembled a solar charging portable Bluetooth speaker, learned how the device worked and how to repair it. The speakers were taken out to be used in another project. Students also studied the Adafruit metro arduino board.

Pukalani Elementary

With the help of a grandparent volunteer and the program's garden teacher, the students were able to plan and build an aquaponics system. The students used science and math to do this. The system consists of two grow beds, one with black cinders and one with water only. The students also have a control group using traditional agriculture (soil). They are keeping data on the three growing methods in order to compare them to find the most effective method. In November and December, student teams competed in 5 Maui League VEX IQ Tournaments.

STEM Exploration Gr 1-2: In October, the students worked through coding puzzles with Dash and the Blockly App on the iPad. They used the Engineering Design Process to build costumes for the dash out of Legos for Halloween.

In November, the students focused on the engineering design process. Students used K-nex to plan, build, test, and evaluate structures used to hold up books. They also used the same process to build vehicles with small motors. Students used Cubelets to build vehicles, flashlights and windmills.

In December, the students completed an Hour of Code. They worked in partnerships on "Dance Party" on Code.Org. They also worked with the Sphero. They got comfortable driving the Sphero and when ready, some of the students tried to program the Sphero to move through an obstacle course. One of the first graders asked for help each time the Sphero went off course. She was encouraged to persevere and problem-solve. After productive struggle, she was able to reach her goal.

Coding & Robotics Gr 2-3: In October, students continued to practice their coding skills on CODE.org. They applied their skills using BLOCKLY and DASH. Students used the step by step cards to learn the different code blocks and how to achieve a change of color, a sound and movement forward/back/ left and right. Students were able to create algorithms to make their DASH robot create an L, C and to go completely around four chips. Students were taught about 90 degree angles and worked in pairs learning to take turns, and create a plan to accomplish their task in a timely manner.

In November, students created codes to have DASH spin in a circle and move through a path that they created. Students used tape measures to measure the path and enter the correct distances.

In December, students created pathways using popsicle sticks and used a measuring tool to determine the distance they would need to use in their code. The Competitive Robotics Team redesigned their robot to move faster and gain 15 points in their programming.

Let's Code and Invent Gr 3-4: In October the students created a Jan Ken Po game with Microbits and collaborated on Scratch to code a video game. In November, the children worked on coding on Scratch, pairing up to do multiple functions with their sprites. In December, students worked on finishing their Scratch programming. They also paired up to program the Sphero with a maze that they built. The students also worked toward building LED-lit cards.

Stewards of Hawaii: Junior Rangers Gr 3-4: In October the focus for was on habitat and its role in the survival of organisms. Students dove deeper into different species that are invasive and detrimental to native plants and animals. Students also participated in a school clean-up, which got the students outside and let them give back to the school and let them practice the value of Kuleana (responsibility).

In November, the focus on habitat covered the different types found across the Hawaiian Islands. Students explored and then articulated the needs of specific plants and animals and the impact of environment. Students also studied how plants and animals came to Hawaii (via wind, waves, and wings).

In December, the students focused on coding to spur interest in other areas of STEM, working with "Spheros" technology. Students practiced coding on the website "Coding.com" and got to pilot and maneuver Spheros through student-made obstacles. On the last day of the program students were able to reflect and give their opinion on why they would encourage others to join the Junior Ranger program.

CAD and 3D Printing: In October, students made a replacement gasket for the 3D printer. This required trials and then redesign, and the exploration of modeling concepts like rotational symmetry and duplication. In November, the students began creating flyers and posters based on a "client prompt" set up by teachers to develop entrepreneurship and service learning opportunities, for a Valentine's Day event. The kids also started using Wacom tablets. Many of them made a lot of progress in the understanding after using the tablets.

In December, we finished up final projects, and printed out selected artworks for the students. Students created various holiday cards (Halloween, Thanksgiving, and Christmas) and appreciation cards for their teachers. They also created personal artworks using the Wacom tablets and the skills learned over the course of the class, such as live tracing an image, working with shapes, layering, transparency effects, and filter effects. Concepts like composition and color theory were a bit too advanced for the majority of the class, but some kids have picked it up a little and applied them to their personal artworks.

3D Printing: Finished up final projects. Printed out as many designs as possible in the remaining class time. Final projects included creating a spaceship, building a house, and modeling simple animals. Students attempted to use the skills taught over the course of the class, like merging shapes, using the work planes, taking accurate measurements, etc., The students who demonstrated an ability to thinking 3D were able to create fairly complex designs, but some designs were too complex for the printer to handle without the use of support structures (which was beyond the level of instruction for these students).

Movie Making Gr 3-5: In October, the students worked on scriptwriting and memorizing lines, as well as a weekly broadcast news production. In November, the students used their knowledge of digital media (PreProduction, Production) in creating a STEM showcase film for our December STEM night. They learned how the basics of using Final Cut Pro and how to use the Green Screen. They also helped the school's STEM research team with their VEX IQ Research video Presentation. In December, students completed a short film/video giving an overview of the Pukalani STEM Program. They used Final Cut Pro to edit their video after production.

Graphic Design Gr 3-5: In October, the students made Halloween masks. They started by deciding what type of mask they wanted, determine how to use the brush tool, shapes, and stencils in Photoshop. They also designed Halloween pumpkin faces using the pen tool. The pen tool takes patience to get smooth curves for their designs.

In November, the students focused on helping the community of Makawao by helping to make the pamphlet cover for the TEDx Youth event at King Kekaulike High School. Students began with information from the student coordinator of the event (Bianca), which included the theme for this year. The students fulfilled some of the steps of the Engineering Design Process. They understood the problem/project in front of them- how can I portray the theme "Shaping the Future" with a design? They did research and asked themselves "What would I want the future to look like? What do I want to be when I grow up?" They drafted a sketch of their designs on paper before starting on the computer. They made a "prototype" or 2nd draft with Photoshop using their sketch as a guide. They then presented and explained their draft in front of the class and Bianca. Bianca then explained the concept of TEDx Youth to the students, so they have a better understanding of what they're designing. She also gave them feedback to improve their designs. Then on the final day, Bianca visited for the final draft of the covers, gave students feedback and requested changes. Students sent in the final drafts to Bianca and she invited them to the TEDx Youth event. The students learned the value of time management because they were creating a cover design, not for themselves like other projects, but for the community with set deadlines for 1st drafts and final drafts for the meetings with Bianca.

In December, the students used all the tools and skills they learned this semester to make holiday cards. The students searched for fonts using DaFont, making sure they were approved for 'personal use' before downloading. The students used the pen tool to create gingerbread men, santas, reindeer, and even animated characters. The students got frustrated in the middle of pen-tooling, but they persevered. Knowing how to use the pen tool in Photoshop is a reward in itself so the students were excited to see that they created exactly what they wanted.

Advanced Robotics Gr 4-5: In October, the team continued to make improvements to their robot. Team Red added a sideshift wheel, lowered their arm to pick up hubs, and fixed their pickup fork and plow multiple times. Team Yellow made their backside sturdier, made a rotating arm, added a side shift wheel, and added a compound gear to hang their robot high enough to get 4 more points.

In November, the students used the Engineering Design Process to improve their robots for the next competition. One team redesigned their robot to be able to pick up hubs off the ground. Another robot created a device that could hold and tilt a hub so that it could roll over a barrier and score more points. Our programmers created codes to pick up the bonus hub and scoot 3 orange hubs into the corner scoring zone. They applied touch sensors to advance to another code to add the ability to hang.

Lokelani Intermediate

Robotics & More! In October, the students participated in the 2018 Maui High School VEX competition with a 6th grade team for the first time. The VEX IQ teams also conducted a scrimmage with St. Anthony School as they mentored them in programming and robot design and building. They also celebrated Girl Power with an event for VEX IQ. In November, the instructor attended the SOTF Conference. Students continued to participate in the Maui VEX IQ League as well as the Lahaina VEX IQ Tournament and got 3rd Place. Students continued to mentor Kihei Elementary and St Anthony for VEX IQ. They also started using SNAPCAD Robotics Software to

prepare for the upcoming Maui VEX IQ League Finale and had a fundraiser for the 2019 Hawaii STEM Conference. In December, students won the Judges Award at the Maui VEX IQ League competition and won the Sportsmanship Award, and came in 1st place in the Valley Isle Vex IQ tournament (the school's first Tournament Champion Award), qualifying for the State championship.

Forensic Math Counts: In October, the students practiced the past competition team/sprint round. They focused on problem-solving skills and communicating reasoning. Each student practiced taking the lead and explained progress to each other. In November, for Math Counts, students continued problem solving in groups. The students practiced presenting and reasoning skills. They share their solutions with more confidence and gain math knowledge. In December, Math Counts students practiced team round, and count down round. Students kept developing confidence by reasoning through their solving process. They presented their answers and the strategies used.

Agriculture: In October, the students collaborated and started designing a Lokelani FFA website, to post information about their endeavors, events coming up, items for sale, etc. Students did online research about various fruit trees/plants to grow. Students shared what they learned with each other, then propagated these plants. Students did nursery maintenance: Weeded, transplanted starts into larger containers, made more succulent and native stocks from cuttings of existing plants, fertilized nutrient deficient plants, quarantined diseased/sick looking plants. One student documented (with camera) then researched different types of insects that he observed in the school garden. As a group, students strategized the 3 big upcoming projects for the year: development of a fruit tree orchard, development of a South Maui Native plant conservation genetics garden, and a "cafeteria green waste to compost" initiative). Students helped facilitate and run a pumpkin patch event in collaboration with Lahainaluna High School FFA members.

In November, the students planned and prepped for a plant sale at the Kula Farmer's Market. Various students collaborated on the Lokelani FFA website. Other students worked on plant propagation, nursery maintenance, advertisement for the plant sale, pest management, etc. Students also reviewed and started researching more about the available CDEs (Career Development Events) that they can compete in at the upcoming FFA Maui Convention at UHMC.

In December, Students planned and prepped for their plant sale at the Upcountry Farmer's Market, and continued designing the Lokelani FFA website. Selected students worked on plant propagation, making value-added products with succulents, nursery maintenance, etc.

Photography/Digital Media

In October, the students finished going through our camera "menu" settings; began using the tripod and spent several sessions practicing putting them together, leveling them, and taking them apart. Used the tripod to begin practicing portrait photography (including tips, techniques and used Google to find different portrait "poses" to practice doing and suggesting to others). In November, students worked on creating their own portfolio of ABC's (letters in our surroundings) to create a project to showcase at parent night. Students used creativity to finding letters, or make them. All photos were uploaded onto Google docs, then students used Canvas or Adobe Spark Post to create their ABC collages.

The program made good use of "entry" and "exit" tickets for students to give feedback about what they are learning and still needing. Students increased in their focus towards homework since the implementation of "entry" tickets (asking "what homework will you be working on today?") and they worked together when they have questions. Students spent the last few class sessions preparing for their showcase (they planned, prepped and scheduled themselves for the table), then had some fun making photo notecards (printed photos, measuring them, then gluing to blank cardstock) to use as Christmas presents. Attendance increased 16 students on the roster (7-10 each session).

Let's Create! CAD & 3D Printing: In October, students began using 3D pens to create a variety of designs. They also began using Tinkercad and AutoSculpt software. They used an Ultimaker 3 to print out several designs such as a model airplane and algebra tiles.

In November, students continued working on TINKERCAD and ULTIMAKER. There were technical glitches (connecting the printer to computer, downloading and uploading designs and software). Students worked on problem solving, communication, and teamwork. In December, the students got ready for their Curriculum Night

show case. They used Powerpoint slides and presentations skills, collaboration and communication skills for the show case.

Let's Code: During October, students used the Sphero robots and Hopscotch to work on Coding. They looked through lessons on the Spheros site and tried a game about Hungry, Hungry Hippos. The instructor set up Hopscotch accounts so students could make games. Most students were able to write code to design a Crossy Road game and modify the attributes of the game to make it more challenging and/or interesting. Students spent time doing homework at the beginning of the sessions. If they did not have homework, they worked on IXL, ST Math, or read a book.

In November, the instructor met with Site Coordinator to go over Needs and Procedures and began to implement Entry and Exit Tickets each day, and fill out Grade Check Papers once a week. Students used the LittleBits Coding Kit for several lessons, including Guitar, Hot Potato, and Soccer Shootout. Students tried the Olly Sphero and became interested in droids. Students did grade checks and worked on IXL or ST Math for the first 30 minutes.

In December, the students used the Little Bits Droid maker to create the R2D2 Droid and used the Olly Sphero to go over a ramp. Students took Slo-mo videos of the Olly and can make these into videos to be shared. Students wanted to make bigger ramps and a stunt park for the Olly Sphero. They completed a droid and became interested in figuring out what they can do with it. Students did Grade Checks every Friday and worked on Homework or IXL the first 20 minutes of STEM time.

Quarter 3 Summaries (Jan, Feb, Mar)

Lahaina Intermediate

STEM Variety: In January, the students learned the basics of video editing. They started off by duplicating Public Service Announcements as templates and then built upon their skills and created their own PSAs. Some students started working on STEM competition projects, "Activating Change" and community pieces for Hiki No. Some students also worked on coding with Spheros. They used math skills to determine the direction and distance needed to complete certain tasks. Two guest speakers came to the program to share their STEM careers and pathways with the students: a metallurgist from Las Vegas and a professional drone videographer from Maui.

In February, students finished learning basic media production video editing. A video the students created aired on PBS Hiki No. Students focused on T-shirt design using Photoshop, photography and 3-D printing, and other STEM design challenges to submit for the Hawaii STEM Conference. Some of the areas of focus were game design with coding on Bloxels, photography, mascot designs on Photoshop and superhero designs with CAD using Tinkercad and Fusion 360. Students also worked on math homework that addressed the skills of modeling linear functions. Students brainstormed ways to build a bicycle-powered phone charging station. They made rudimentary DC motors with magnet wire, batteries, and magnets, and used an oscilloscope to measure the voltage of various motors.

In March, students worked on stop motion projects, creating a visual story that was at least 30 seconds long. Instruction included how to incorporate literary elements, such as plot and climax. They had to figure out frame speeds, and practice collaboration with each other, building their characters with Play-doh and designing a story. Students prepared for the STEMworks conference by working on Spotlight presentation and write-ups.

Lanai High & Elementary School

The site coordinator met with students to start thinking about the STEM conference. She also attended classes during the day to spread the word about the program to encourage students to attend.

In January, students focused on homework and coding in CODE.org. Students made personal goals and worked on steps to achieve them. They also used Legos to create tops and challenged one another.

In February, homework completion was a priority before jumping into STEM activities. Then students started working on STEM conference projects. video/photography of STEM labs. They used the iPads and explored different problem solving and coding games.

In March, students worked on STEM Conference projects. They worked with Arduino cars, video and photography. Students also got reacquainted with the B4UFly app to help with safe drone flying. They checked for any hazards and air conditions and rehearsed flights based on the information.

Maui Waena Intermediate

Digital Media & Robotics: In January, students continued to practice the engineering process in video production, robot design and CAD. They honed their skills, creating prototypes, or rough drafts, and continued to improve and perfect them. Students worked on their writing and speaking skills as they prepared for the STN competition. Teachers provided guidance on the selection of story topics. Instructor reviewed their scripts and challenged them to improve structure and detail.

Summer session and mentorship from IFA professional, JD Armstrong, inspired two 6th grade students to continue work on their science fair project, for which they won First-place in the Maui County Regional Science & Engineering Fair Junior Division. They used the scientific method of photometric observation in their award-winning project, "Used Car, High Mileage" (<http://www.focusmauinui.com/used-car-high-mileage/>).

In February, students continued to improve their scripts, and their speaking skills. Students continued to practice the engineering process in video production, robot design and CAD. Students prepared entries for the STEM conference, Olelo, 808 Digital Storytellers, and STN nationals. In March, students stockpiled videos for Falcon Features to cover their week attending STN conference and preparing for the conference itself. 25 students and 8 chaperones traveled to Seattle to do college visits, community service, visit museums, and attend classes lead by industry professionals in news, journalism and video production along with competing in 10 categories. Students garnered three 2nd place finishes and two honorable mentions.

Engineering, CAD, & 3D Printing: In January and February, the students independently completed design and production of functional prototypes of a replacement joystick for a camera gimbal and two types of tripod mounting plates. One student completed a 6-month design project of a butterfly comb and 3D printed his first prototype. Several students completed graphic design projects using Adobe Illustrator, Inkscape, or After Effects.

In March, students worked on design projects for STEM Conference competitions. CAD Kids designed and are 3D printing a CAD Superhero, with other students writing narrative and creating story.

Computer Science: In January, students practiced angle and rate modes when piloting drones. They designed a temperature display device with Adafruit feathers and sensor. They designed an enclosure for the temperature device. They also studied PWM and how to use it with Arduino devices, and assembled Bristle bot kits. In February, students brainstormed a way to build a bicycle-powered phone charging station. They made rudimentary DC motors with magnet wire, batteries, and magnets and used an oscilloscope to measure the voltage of various motors. In March, students took apart a consumer dehumidifier for spare parts and to learn how it works. Students replaced a missing 3 position switch in an RC transmitter.

Pukalani Elementary

STEM Exploration Gr 1-2: The first graders explored various coding "toys." They programmed Beebots to get to targets. They also did the coding Osmo game. Students learned to code using a CODE.org. All activities were done in pairs so students were able to collaborate and learn from each other.

In February, students learned about coding for video games, and used coding+dot to play hot-potato and spy maze. Students built bridges out of K'nex using the engineering design process. Students used Osmo coding to learn sequencing and repeat coding. Students practiced cause and effect coding, and used their learning to play games. In March, students practiced degrees and angles and reinforced learning through programming dash and dot to drive various shapes.

Grade 1 & 2 Robotics: In January, students used Osmo coding learning tools and learned the basics of moving forward, backward, hopping and turning left and right. Students were introduced to SPHERO. They learned to use the iPad to control the speed and direction. Using popsicle sticks, they designed their own wide and narrow tracks to practice driving their Spheros through the maze. When they got better, they narrowed the tracks and weaved through obstacles to challenge themselves. At the end of the practice session, the pairs of students tried the knock down the most pins in bowling.

In February, students created courses with varying difficulty levels and drove their Spheros through the courses. Students learned the velocity was a factor. Students showcased their best work in hopes to inspire other students to work toward new goals. Robotics team students created a new design that included two locking arms that could drag hubs over the blue strips and easily score. Later they found that by adding these lockers, it made the robot too big to pass inspection, so they redesigned it for the State competition. In March, Grade 1 students were introduced to DASH. They first completed task cards to learn the basics of programming DASH to move forward and backwards. Later they learned about 90 degree angles and completed task cards to make DASH complete a square, rectangle. The competition team created redesigned their robot with additional attachments (hub lockers) that locked in hubs in the front and the back so they could carry over 5 hubs at once. They were very proud of this design and it worked well however, it was slightly too long so they returned to redesign.

STEM- Kindergarten and 1st: In January, the kindergarteners learned the terms algorithm, program, and sequence while using the Code-A-Pillar. They learned to work together with their partners and communicate. They also worked on measuring how far the Code-A-Pillar goes with an added a segment. In February, Kindergarteners continued to practice working together to program the Code-a-pillar. Students focused on trial and error and persistence with troubleshooting bugs. They also used Tiggly Draw to create and used it as an inspiration for stories. In March, students used Osmo Tangrams, Numbers, and Monster. The students employed creativity, critical thinking skills, and teamwork to draw, solve puzzles and create equations.

Coding & Robotics Gr 2-3: Students used Unifix cubes to practice coding sequences through games. Students learned the definitions for code and command, and they practiced coding using Dash and self-directed learning cards. Students practiced teamwork with Osmo rotations.

Let's Code and Invent Gr 3-4: In January, students coded with the Mirco bits to play jan ken po, then held a competition. In February, students built a Little Bits Star Wars R2D2. They worked in pairs on teamwork and coding. In March, they worked in pairs to program Spheros. The students enjoyed working on communication by having one partner tell the other where they wanted the sphero to go.

Graphic Design Gr 3-5: In January, Beginner's digital media went over the basics of Inkscape and graphic design. Students made a business card, and some animal drawings. Advanced digital media started learning Google's Sketchup, and working on entries for the STEMworks competitions in mascot and superhero design. In February, Beginner's Digital Media students learned specific tools relevant to the things they wanted to create. Advanced Digital Media started learning the basics of Photoshop. A few students were interested in animation so the class also learned frame animation using Photoshop's timeline. Students were encouraged to persist at problem-solving and self-learning with these programs, and to recognize features that are universal across operating systems. In March, Beginner's Digital Media started learning Tinkercad. Went over basic tools and merging shapes to create complex shapes. Advanced Digital Media worked steadily at 3D printing projects.

Movie Making Gr 3-5: In January, students learned about scriptwriting and wrote a script as a group: "Maui Cindy: Our Local Cinderella." Students got to practice writing, reading and memorizing their lines. In February, students worked on producing a live broadcast morning show. Students wrote their scripts, directed, filmed and acted in front of the camera. In March, students did short film production for "Local Cinderella." They practiced acting using monologues and script memorizing.

Photoshop Gr 4-5: In January, the students worked in Entrepreneurship class. They were tasked to design "Leader of the Month" bumper stickers and button pins for their school. The students had 2 weeks to sketch, draft, and finalize their designs. After the first week of sketches and drafts, the teacher/"client" picked 3 potential button

pins designs for the bumper stickers and pins. Those 3 designs then had to be drafted on Photoshop. The students that didn't get their designs picked helped make a matching bumper sticker. The 3 students that got their designs chosen had a meeting with the "client" and she went over what final changes she wanted. This exercise taught the students learned about getting a product/design out for a client. They learned the design process of sketching, drafting, receiving feedback and using feedback from the client.

In February, the students focused on creating their own graphics "business" logo vinyl stickers. They had to brainstorm at least 6 designs that represented them and graphic design them in black and white. Out of those 6, the students picked 3 designs to create in Photoshop. While drafting in Photoshop, the students discovered the design challenges of the "black and white" limit. The computer is different than drawing on paper. In March, students gave feedback and brainstormed ways to improve the classroom by using Photoshop. They chose to design cubby labels. Through this exercise, students are practicing how to pitch an idea to someone as part of the design process.

Advanced Robotics Gr 4-5: In January, the robotics team continued to improve their aquaponics garden. They taught themselves how to test the water's pH levels. Coming back from break the kids were energized and excited about building a competitive new robot. They returned with ideas and drawings about how they wanted to improve the robot. They set a timeline of goals.

In February, the students teste the feasibility of their timeline and learned from mistakes. Through match, students continue to build and develop their robots as well as their hydroponics project for competitions and made it to Nationals competition in April.

Gardening: In January, students were introduced to the Engineering Design Process and asked to redesign their 2nd grade garden. After discussing the users of the space and the purpose of a school garden, students were split into groups by interest, to collaborate to define problems and think of solutions that could help alleviate these problems and develop a plan of action. Each group was given a packet of graphic organizers to record their thoughts and discussions by writing and drawing. Students were also given individual writing assignments to describe a problem in the garden and possible solutions.

In February, students continued to the next phases of the engineering design process by devising a plan (create). They either measured garden supplies and space to design a supply storage shelf, designed a bridge for students to cross over garden beds, or created a fundraiser program. Collaboration, communication, perseverance, critical thinking, adaptability and gardening skills were all employed. A lot of time was put into creating a flyer, getting permission from authorities, painting the farm stand, deciding on prices, products to be sold, and sale times and location. Seeds were planted and various plants were propagated in pots for sale. The team decided to prioritize the fundraiser as key to funding their other projects. STEM researchers acquired a testing kit for the monitoring of pH and nitrate levels in aquaponics system. The students figured out how to use the kits and how to interpret the results. They also learned how to adjust the system to ideal levels.

In March, students continued in their entrepreneurial efforts to secure funds to execute their design plan. Students made connections to math while figuring how much money they made each week and used critical thinking skills to maximize sales. They were able to raise enough money to purchase an automatic watering system. Students continued their advertising efforts, potted and propagated new plants, and tracked plants sold. Students discovered a pattern in the plants purchased and were able to figure out which plant was bought most, learning about supply and demand. Students learn leadership skills as they talk to passersby about their products and cause.

Lokelani Intermediate

Robotics & More! In January has 2 teams competed in the 2019 Island Pacific Academy VEX IQ Tournament. In February, Team Sushi was awarded the Sportsmanship Award at the Island Pacific Academy tournament and Team Kolohe Kids won the TMT Big Island Tournament along with being awarded the Design Award for the best Engineering Notebook. Lokelani Robotics also won first place at the 2019 Hawaiian Sportsmanship Electric VEX IQ Middle School State Tournament in Honolulu.

In March, Lokelani Robotics competed in Iowa for the 2019 CREATE US Open (Nationals). Students networked with the Iowa State Champions to practice and collaborate and exchange cultural and educational experiences, and invited them to the 2020 Hawaii STEM Conference. Our team 5777Y DaNextG3nN is preparing for the 2019

STEM Conference in a few weeks. Students continued to work on fundraising for 2019 VEX IQ Worlds trip by canvassing South Maui in the Maalaea Shops area with Maui Ocean Center and Pacific Whale Foundation as possible STEM connections.

Forensic Math Counts: In January, students practiced problem-solving skills. They worked on past competition, and shared problem-solving processes. In February, students worked at the warm up, competed, and collaborated in groups. One group worked at problem-solving. One group worked on a T-shirt design competition. In March, students prepare for STEM competition and practiced AMC 8 for problem-solving skills.

Agriculture: In January, students prepared for CDEs (Career Development Events) that they chose to compete in at the Maui District FFA (Future Farmers of America) competition at Lahainaluna High School. At the competition, Lokelani advanced to States in the Creed Speaking Competition and Vegetable Judging event. Students also planned logistics and prepared for upcoming fundraisers (school dance, plant sale, use of website) as well as discussed next steps to take on previously started projects (Cafeteria Green Waste initiative, and Wiliwili/native plant restoration project).

In February, students did nursery maintenance (plant propagation and pest management). Prepped for and executed final fundraisers to help pay the way to the states FFA competition in Honolulu. Students applied constructive criticism/feedback (relayed from the judges) regarding Career Development Events (CDE) results of the Maui District FFA competition. Students also helped plan logistics for upcoming Community Garden workday. In March, students worked hard preparing for their competitive events at the Hawaii State FFA convention. Students practiced time management in the process. Students also contacted Hawaii state legislators to schedule appointments with them during planned visit to the state capital building to observe the legislature in session. Students held another plant sale.

Photography/Digital Media: In January, students learned about and explored a telephoto lens, macro lens, zoom lens, colored lens, and external shutter buttons. They used scavenger hunts to practice with new equipment and to try to think of the world more creatively, capturing moments more intentionally (by being more aware of framing and focus while photographing).

In February, students started a new unit called "You're a Professional!" and instruction included discussions about the logistics of being a photographer as a professional career. The students paired up and created their own business name, logo, and business card. They then sketched out some possible events, packages & pricing for their business, and created permission slips for photo shoots after doing some research on some local Maui photographers and templates online. The class heard from local professional photographer, who shared about social media (pros/cons) and how to connect with people and know their story, not "just take their picture." Students experimented with some manual settings on the camera, as well as the "Creative Auto" setting (they were SO excited--that one opened up a whole new world for them!). They contributed to the parent newsletter every week.

In March, students practiced "food photography" and practiced photography outdoors. Student learned from another local professional guest speaker, who practices photography and works with junior high and high school students on the mainland.

Let's Create! CAD & 3D Printing: In January, students installed software and got a different 3D printer up and running (New Matter Mod-t). Students began to work on Superhero CAD contest submissions. The students engaged in teamwork and trouble-shooting problems encountered with the 3D printer set-up and installation. In February, students used NEPRIS and connected with industry individuals who work using 3D and CAD in their professional fields. The students continued working on designing a superhero for the STEM conference. They used teamwork, time management, decision-making, and collaboration and communication skills to design, create and share their designs. In March, the students focused on creating their Superhero CAD for submission to the STEMworks Conference competition. They learned about due dates and finishing quality work in a timely manner. They also learned problem-solving and creativity. Most of the students also discovered other software and used sculptGL and various formats for saving work.

Let's Code: Student attendance was down this quarter due to school related activities that included Basketball. Students needed math support, so a focus was math activities and tutoring. For example, students played battleship to practice coordinate graphing and grids. Students practiced engineering and cosign by building R2D2 Droid Robots. Note: In quarter 4, class cancelled due to lack of availability of instructor.

Quarter 4 Summaries (April & May)

Lahaina Intermediate

STEM Variety

In April, students worked with a variety of STEM skills, including operating parrot drones and a Phantom 4, 3D printing with TinkerCAD & Fusion360 and video editing with Final Cut Pro. Students also worked homework that focused on math skills involving geometric transformations. The teachers spent time helping a group of students prepare for the Spotlight event for the STEM Conference. Lastly, the teachers also prepared for our trip to Oahu to attend the STEM conference.

This month of May students chose projects to work on projects based on their individual interests. Activities included 3-D printing and design, photoshop and video editing. They also learned about mechanical engineering through the designing of and building a marble run contraption. A few students worked on some VexIQ Robotics, thinking about possible designs for next year's game.

The site coordinator worked to prepare and distribute the teacher survey.

Lanai High & Elementary School

In April, LHES students prepped for the STEM conference. There were new students and returning students. The students worked on arduino cars, photos, videos, and GIS. They also discovered and tried new math and science games with the iPad. They used different modes of play to build hideouts, survive challenges, and/or beat the clock to complete different levels.

In May, students came for a wrap up discussion about the STEM Conference, they also wrote summaries of their learnings from the STEM Conference. Students shared their STEM learning at School Community Council meeting May 22 from 5-6:30 pm. Students try various games from coolmathgames.com on the ipad testing their skills. They also take part in dancing to various dance-a-longs (The Twist, Cupid Shuffle, etc.) when they need a break from the screens and talk about the differences in how the music was made during different time periods.

Maui Waena Intermediate

Digital Media & Robotics

In April, students grouped in a way where the experienced 8th graders lead/taught their team in a competition. They created videos for a whole month which challenged them to teach their skills to the younger students. They had a month to create at least 3 videos. The students didn't need much assistance as they were able to teach what they knew. Each group had their struggles with their members not coming or participating but were encouraged to look at solution and help them schedule and plan what they needed to do.

In May, we spent reflecting on our progress for improvement next year and establishing new leadership. May 17th was a parent engagement evening. We elected officers, revamped our checkout system, and began planning for the upcoming year. We also reflected on the STEM conference. We had 21 of the 25 attendees participate in onsite competitions. Some students that wanted a head start with learning some programs before the summer classes. The students were encouraged continue with media in high school. It was a wonderful way to end the year as it was very productive.

Engineering and Computer Science

The students worked on a lot of projects this month of April. Together we disassembled an electric drill, practiced drone flying in the simulator, set up the rear projector screen for video feedback, opened a treadmill to

troubleshoot a failing motor, and We took apart a PoE injector and discussed why PoE (Power over Ethernet) is used and why it is useful. We also discussed ethernet cabling (eg. Cat5). The students learned a lot from those experiences. In May, students practiced drawing circuit diagrams and worked to replace a failing gimbal in an RC transmitter.

3D Printing and CAD

In April, students finished design projects for STEM Conference competitions. The CAD students troubleshot and repaired the 3D printer. They finished 3D printing and painting the CAD Superhero. Other students revised and finalized narrative and creating stories. The students ended up winning the CAD Superhero contest. The students utilized mathematics (dimensions, geometric shapes), material science, and physics to complete their projects the students use professional skills such as critical thinking, problem solving, perseverance, resilience, collaboration, and organization.

In May, the students reflected on design experience and outcomes. They developed a plan for a design, inventory, and plan for expenditures for future use. The students organized space for future use. They utilized mathematics (dimensions, geometric shapes), material science, and physics. The students used the following professional skills, critical thinking, problem solving, perseverance, resilience, collaboration, and organization.

Pukalani Elementary

STEM Exploration Gr. 1-2

In April, grade 1 students worked to become effective communicators. They politely ask Edothers to partner with them, and respectfully declined or accepted. They are also strengthening their writing skills. Using code.org, students sought the most effective and efficient way to reach their goals. Robotics team are preparing their aquaponics system for the next phase of growth.

In May, Gr. 1 robotics students learned about open and closed circuits. They used makey makey hardware to test several materials to see which ones were conductors or insulators. Students used batteries, lightbulbs and wire, metal tape and lead from pencils to create closed circuits. Students also played with GEARs to create intricate systems. Gr. 2-3 Make up classes. Students observed the new VEX IQ games and drew up plans and built robots to address the challenges in the new game.

STEM Kindergarten and 1st:

In April, the kindergarteners got introduced to Osmo Coding and Awbie. They are advancing in their coding skills learning about simplifying their programs using loops and numbers while having perseverance. They are also practicing working as a team and using their critical thinking and collaborating skills to do challenges like paper chain building and tower building.

In May, the kindergarteners were introduced to the Bee Bot, renamed Bug Bot. They have been working together in pairs to program Bug Bot to a goal and through a path. They are advancing in their coding skills, moving from tactile pieces of the Code a Pillar and Awbie to more abstract on Bug Bot. In our last class the children were introduced to code.org so they have an opportunity to sharpen their coding skills over the summer.

Gardening:

In the beginning of April the students prepared questions for a Guest Presenter of Once Again Maui, a successful entrepreneur with a business centered around succulents. She answered students' questions in her presentation, discussed her business strategies, shared her expertise in the various types of succulents and their characteristics, demonstrated how to re-pot a succulent and then also how to make a macramé plant hanger. Students, especially a designated fundraising group, were so inspired by her story of entrepreneurship that they started to craft their own ideas of creative advertising and new products. They decided on re-using plastic eggs to serve as pots for the succulents around Easter time. These were a big hit with customers! Another team worked on their "bridge" and learned how to test and improve. They used rulers to measure the depth that their hole had to be and collaborated to get the job done. The supplies team were able to organize their supplies in their new storage closet that was purchased (from grant money) according to the measurements and dimensions they expressed to me.

In May, garden students designed flyers to help the school advertise for the school garden sale then voted on several options and selected the flyer that included all information clearly and represented the farm stand well. After approval from the principal, this flyer was sent home to each family. Students waved signs on the days of the final sale and were able to raise funds for next year's garden program. Students learned about how to create a business, communication and branding through advertising, having faith and confidence in your product, testing your product's ability to sell, and how math, science, reading, spelling, writing, innovation, creativity and art are necessary to work with real-world problems. They used the engineering design process as a guide to first redesign their 2nd grade garden and then design and execute a plan for a farm stand fundraiser. Students were also able to learn how to prepare a garden for the summer months and finish up their last few design changes in the 2nd Grade garden.

Coding and Robotics

In April, students used dash and coding to program various shapes and mazes. Students used K'nex and the engineering design process to build skyscrapers. Students used Osmo Coding to practice sequencing. Students used Osmo words to challenge each other in spelling. Students used Osmo numbers to practice math skills. Had Students take a day to do Student Surveys.

In May, the students used dash and dot/programming to create games such as "Cops & Robbers - Hide and Seek", "Timed Military Crawl", "Hot Potato". Students used Code.org to code flappy bird game. It was a great end of the year to see how the students used their skills that they learned throughout the year.

Let's Code and Invent Gr. 3-4

In April, the students focused on STEM projects to work on their following directions and writing. We learned that if you don't follow the directions then their projects don't come out.

In May, we practiced our science procedures. One of our science projects was a Mother's Day project with coloring a white flower. They now understand the scientific terms hypothesis, procedure and conclusion.

Photoshop Gr. 4-5

In the month of April, the students drafted their nametag products on Photoshop. They took part in the engineering design process. They defined a problem, e.g., their IDs were just put on a table and got tangled together. They brainstormed ways to solve the problem they had in their classrooms. And now they planned a way to make their solutions happen. A few students finished drafting 3 products, so the next step was to make a script. "How do you present this to your teacher (in this case, the teacher would be their client), so that they could actually use it in their classrooms?" This next step is a part of Entrepreneurship- product pitch.

This May, the students focused on the design and production of award certificates for Pukalani's Awards Night. These certificates are received by students who attended 30+ days of STEMworks AFTERschool. They had to work as a team on this project because each person had a designated task. If one person didn't do their part, the certificate wouldn't be complete. In the end the students picked a final certificate out of 6 drafts.

Moviemaking Gr. 3-5

In April, students worked on creating mini segments for advertisements. They also worked on writing their own monologues and performing them. Students enhanced their writing, reading, and memorization during these processes. In May, students finalized their script for their short film. We have been working on filming and will soon be editing their film. We will be showcasing their short film at our upcoming Parent night.

Advanced Robotics Gr. 4-5

The robotics team had a competition in Iowa. Practices were intense and paid off. The parents were able to raise the funds need to travel from Maui to Omaha, NE and back, hotel, food, vehicles and an adventure to remember for 15 kids and 3 coaches. The team ended in 1st place after the first day of competition and learned what it was like to enter the second day with nowhere to go but down. The students handled their own nerves as well as showing good sportsmanship. By the end of the competition, the students ranked 5th overall for teamwork and 4th for skills, and received the STEM Project Award.

In May, all rising 5th graders that were a part of STEMworks AFTERSchool were invited to learn about robotics in weekend courses. They came in to learn the beginner basics of VEX IQ. They learned simple building techniques and simple programming. The goal was to have them take the knowledge learned to their next school and grade level. They came with some interest but left with a passion to find out more about what they can accomplish as part of Robotics.

Graphic Design Gr. 3-5

There was a steady pipeline of projects going through the printer. The instructor made sure that the students managed the printing process and worked through problems with little intervention. Students know the process of downloading their files, converting them to a format readable by the printer, and setting up the printer. The advanced class worked on a group project.

Lokelani Intermediate

Photography/Digital Media

This April the students learned the specifics of aperture, exposure, shutter speed and ISO. Students learned how they are all related, how to troubleshoot and how to use each one creatively. They also heard from a special speaker, Allen Atkinson, a professional photographer on Maui who shared about his passion to create photography "that you can feel" and how no matter what kind of technology we are using, we can capture creative, stunning photos. Students ended the month with a scavenger hunt and began their final unit, "DSLR VIDEO Setting."

In May, students made instructional videos on how to use the camera equipment, techniques behind and in front of the camera, and interpersonal tips with other people. They celebrated the end of the school year with learning how to make haku lei, going to the beach (sunset photos!), making notecards of their own photos, and finally with a game day (awards, Kahoot, snacks, and Quelf).

Robotics & More!

Students began the month with the 2019 CREATE US NATIONALS and got 6th place overall and were awarded the Sportsmanship Award for middle school. They also travelled and competed in the 2019 VEX IQ World Championship in Louisville, Kentucky. The students placed 72nd out of 100 teams from 45 countries. They also volunteered throughout the VEX EDR tournament, giving back to the robotics community; networked with other students and teams; and were exposed to information on college and career opportunities. They had the opportunity to talk to representatives from companies that use robotics in their industries such as UPS, FEDEX, TESLA, Northrup Gruman, Toyota, Nissan, RobotMesh and HEXBug. Students also shared about STEMworks AFTERSchool and invited teams and individuals to STEMWORKS 2020. In May, students demonstrated the robots and signed up new members from feeder schools at our parent night for this summer's Boys & Girls Club program.

Let's Create! (CAD & 3D Printing)

This April, the students worked on various CAD software adding Adobe Sculpt to their CAD repertoire. They used research, decision making and problem-solving skills to fix a 3D printer when the extruder was not working properly. Some students began delving into planning, animation and worked on collaboration skills to create designs in the area of toy-making, fabric design and computer animation. In May following the STEM conference, students began to explore other categories such as ArcGIS, ESRI, and story mapping. Students looked at litter on campus and began to map out the school campus. Students started to create and design their own maps in CAD and upload them onto the ESRI platform.

Agriculture

In April, students prepared students for the FFA State Convention (first week). We attended the FFA State Convention April 3- April 5th in Honolulu. Students participated in various Career Development Events that were related to public speaking and Agriculture workforce skills (vegetable judging, FFA Creed, job interview, and Educational /research display competition). Students helped create a schematic plan for the irrigation in our garden, then we used it to complete phase 1 of a major irrigation project = installed new manifold (with valves)

and tools that support hands on engagement and application with coding, prototyping, digital media, drone/GIS, virtual reality, and circuitry and hardware.

Program sites with robotics also utilized curricular resources from VEX and VEX IQ robotics and Lahaina Intermediate and Lokelani utilized curricular resources for Math Counts. Lokelani’s agriculture program aligns with Future Farmers of America. All sites utilized Autodesk CAD software, TinkerCAD and/or Fusion 360, and most site utilized Adobe CS6 through Photoshop, design and media, as well as After Effects software.

MEDB’s STEMworks AFTERSchool™ at Lahaina Intermediate School (LIS), Lanai High & Elementary School (LHES), Lokelani Intermediate (LOIS), Pukalani Elementary School (PES) and Maui Waena Intermediate (MWIS) continued to utilize STEM supplies that retrofit their STEMworks AFTERSchool™ labs. Supplies for expanding application of coding, robotics, digital media, and 3D printing were purchased as needed.

Funding supported the inclusion of STEMjobs career curriculum posters and magazines for all sites. These classroom toolkits provide relevant career stories and information about STEM career possibilities, including alignment to prerequisites and lists of colleges that offer pertinent degrees and companies that hire for a variety of STEM careers.

Site Supply Summary for STEMworks AFTERSchool™ purchased during the 2015-2019 program years; few supplies were purchased during the final grant year (18-19).

LHES
Digital Media: Cameras, Camcorders, Color Printer
Robotics & Programming: Littlebits and Arduino kits, Spheros, Ozobots
3D Printer & Filament, TinkerCAD, Fusion 360
Computers: Set of Laptops, tablets/cases
Drones: Phantom 3, drone parts (such as batteries, motors, propellers), repair toolkits
Securing supplies: Combination Locks

Note: Leveraged funding and partnership were utilized during the program year at LHES, which provided students with access to more laptops.

MWIS
Computers: Set of MacBooks and iMacs, Apple TV, adapter, and mice
Digital Media: Cameras, video mic sets, tripods, SD cards, Bloxels, Adobe Creative Suite, After Effects
Robotics: VEX and VEX IQ kits (Foundation, Add-on, Booster, and Super Kits)
3D Printer/Engraver, print filament & engraving supplies, gimbal kit builder, Fusion 360
Drone design kits (frame, circuitry, batteries, motors, propellers), repair toolkits

Note: Considerable leveraged funding was utilized during the program year at Maui Waena, which provided students with access to more cameras, camcorders, tripods, iMacs and MacBooks.

LIS
Digital Media: Cameras, video mic sets, tripods, SD cards, Bloxels, Adobe Creative Suite, After Effects, Macbooks
CAD and 3D Printing: PCs, 3D printer & filament, 3D design mice, TinkerCAD, Fusion 360
Robotics: VEX IQ Starter Kits, Littlebits Coding and Smart Home Kits
Programming: Littlebits, Raspberry Pi kits, Arduino kits, Spheros, Ozobots, Cubelets, Parts and tools for building

computer server to host & program, Minecraft EDU accounts, micro:bits

Note: Leveraged funding was utilized during the program year at LIS, which provided students with access to more laptops.

Lokelani
Programming: Littlebits, Raspberry Pi kits, Arduino kits, Spheros, Ozobots, Cubelets
Digital Media Supplies: Macbooks, laptops, Shortcut keyboard covers, cameras, SD card, mice, Bloxels, Adobe Creative Suite
Agriculture: Tools and supplies
CAD and 3D Printing: 3D printer & filament, TinkerCAD Fusion 360
Robotics: VEX Kits: Super, Booster, Challenge, Add-ons, motors
Drones: Codable drones, drone parts (such as batteries, motors, propellers), repair toolkits

Note: Leveraged funding was utilized during the program year at Lokelani, which provided students with access to more laptops.

Pukalani
Programming: Littlebits, Spheros, Ozobots, Dash & Dot, Osmos, Cubelets, Code-a-Pillars, micro:bits
Digital & Graphic Media Supplies: Macbooks, laptops, cameras, design tablets, SD card, mice, Adobe Photoshop, After Effects
3D printer with filament, TinkerCAD
Robotics: VEX Kits: Super kits & add-ons
Early Elem Academics: Tiggly, Osmo letter and numbers

Note: Leveraged funding was utilized during the program year at Pukalani, which provided students with access to Watershed field experiences and supplies.

3.E.2 Resources: *What resources (e.g., grant funds, physical facilities, in-kind personnel, community partnerships) were available?*

Grant Funds: The program expended its entire budget of \$200,000 in grant funds.

Leveraged funding supported the following activities:

- June 2018-May 2019- Maui Waena teacher and two Lokelani teachers attend the Code.org TeacherCon Workshop to deliver computer science curriculum to students. Teachers were guided through computer science curriculum and learned fundamental skills through an intensive 5-day workshop and attended four workshops throughout the year. Computer science lessons build teacher’s skills prior to introduction in the classroom. Leveraged through Maui Economic Development Board’s regional partnership with Code.org.
- June 2018- ISTE Conference attended by STEMworks team
- June/July 2018 - Maui Excite Camps for Girls attended by Maui Waena, Lokelani and Lahaina Intermediate students to expose middle school girls to STEM and culture.
- Sept 4-13- Lokelani, Lahaina Inter and LHES participated in cyber web-based platform that guided students through principals of cybersecurity and career exposure called *NSA Days of Cybersecurity*; Midweek, schools were invited to join live webinars to meet local cybersecurity professionals and ask questions throughout the day during *Cyber Connections, Hawaii Webcast*.
- Sept 14 – Maui Waena, Lokelani, and Lahaina Inter attended Space Exploration Day at AMOS Conference. The program is in its 9th year. The goal of the day is to explore what it takes to become a space explorer through space themed science experiments and the newest technology demonstrations are showcased.
https://amostech.com/amos-2018-space-exploration-day/?fbclid=IwAR0ERdjU2r53BYA0vSi8e4j0c77xtLou_eUjmgBRo4CKOBQLul5Uc-caTdw

- Sept 22– Pukalani, Maui Waena, and Lokelani attend the VEX IQ Maui League scrimmage among teams on the island, this scrimmage was organized by Lokelani STEMworks AFTERSchool facilitator
- Sept 24– Pukalani Elem students attended a Junior Ranger program at Hosmer’s grove: Students learn about native species, adaptation and culture from National Park Educational Ranger while hiking through loop trail at Hosmer’s grove and tying in the class curriculum with place-based learning.
- Oct 13 – Girl Powered Workshop at Lokelani, organized by Lokelani facilitators. This event was designed to help introduce students from the Kihei community (particularly girls and young women) to the various STEM-related employment and educational opportunities available to them. It is part of the month-long international celebration of women in technology and involved design challenges to test problem-solving skills.
- Oct 23- Lanai High and Elementary College and Career fair (In partnership with Lanai community foundation), STEMworks AFTERSchool site coordinator supports organization for this event and STEMworks team suggests outreach professionals to attend: student meet professionals from across the state to learn about college and career opportunities. Students preplan and rotate through stations they are interested in). STEMworks assisted with the organization for this event and reached out to professionals to attend so students had the opportunity to meet and talk with professionals across the state.
- Dec 13 & 15 –Lahaina Inter and Lokelani facilitators and students attend ArcGIS Geospatial Training with professional geospatial analyst: Esri’s Charlie Fitzpatrick. Students learned how to utilize ArcGIS and storymapping in a 2-day workshop. Skills aligned with careers using industry standard software as well as practice opportunities from ESRI’s and taught skills to enter the Hawaii STEM Conference Geospatial Mapping STEM competitions in Spring 2019.
- Feb 2 Lokelani attended VEX Tournament on Big Island; there were the Tournament Champions and awarded the Design Award for our Engineering Notebook showcasing teams engineering design process with meticulous explanation of their processes throughout the season.
- Feb 9 –Lokelani and Lahaina Inter attend the Math Counts competition; Lokelani placed 4th in countdown round.
- Feb 19, 2019- Lahaina- (Leveraged) – One facilitator attends The Hawaii Association of Middle Level Education (HAMLE) Conference; A full day to include motivating speakers, engaging breakout sessions, gallery walk of student displays, Middle Level Educator of the Year announcement, breakfast and lunch provided, door prizes, vendor displays, and more! All in the spirit of promoting and supporting Middle Level Education in Hawaii’s schools.
- April 24, 2019- Lanai High and Elementary- Students recognized for imovie about the dangers of vaping at Olelo Youth Xchange Awards Gala <https://www.lanai96763.com/news/lhes-students-victorious-olelo-video-competition>
- May 1 and 2, 2019- All sites attended the Hawaii STEM Conference on Oahu. Students from all middle school sites engaged in STEM competitions, onsite competitions, student presentations called STEMworks Spotlight, and learned from industry partners in breakout sessions and Hackathons over the course of the two days. <https://www.khon2.com/news/local-news/wake-up-2day/10th-annual-stem-conference/1964111317> and <https://mauinow.com/2019/04/11/10th-annual-hawai%CA%BBi-stem-conference/>

Maui Economic Development Board’s Ke Alahele Education Fund

- Lahaina program teacher awarded Math software grant from MEDB Ke Alahele Education Fund to support math integration into the classroom with software and supplies; previous year was a success so facilitator was awarded again.
- Lahaina program teacher was awarded to support students and teachers in attending the 2019Hawaii STEM Conference.
- Maui Waena program mentor and volunteer awarded robotics grant from MEDB Ke Alahele Education Fund for support and transportation of VEX Robotics and Botball competitions; previous year was a success and mentor was awarded again.
- Pukalani program teacher was awarded to support students and teachers in attending the 2019 Hawaii STEM Conference.

- Lokelani program teacher was awarded to support students and teachers in attending the 2019 Hawaii STEM Conference.
- Lokelani program teacher was awarded to support students in VEX Robotics and competition transportation
- Lanai High and Elementary used Ke Alahele DKI Award to attend the Hawaii STEM Conference.

In-Kind Access to Software:

30 seats for each: Esri (\$2000 per seat) and SketchUp (\$695 per seat). Autodesk CAD products including Fusion 360 (\$495 per seat), Tinkercad and 123D Apps.

In-Kind Access to STEM Related Competitions and Activities:

- Maui Waena Participates in: (1) STN (winning 1st place feature story–Driven to serve and 3rd place PSA–Seatbelts change lives, 2nd place Crazy 8s broadcast–Native American Culture, 2nd place convention promo, 2nd place PSA-Going Green, Honorable mention feature story-Purple Store, Honorable mention crazy 8s short film–Puddle Jumper) (2) Olelo (winning 1st place PSA–The Last Straw), (3) 808 Digital Storytellers (winning 1st place animation–Seatbelts change lives, 1st place PSA–The Last Straw, 1st place Feature Story–Aquaponics Hawaiian Style, (4) PBS Hiki No (winning 1st place Winter Challenge–Driven to serve, 1st Place PSA–The Last Straw, 3rd Place Music Video, 3rd Place Fall Challenge–Local Farmer
- Lanai High and Elem participates in Olelo Youth Xchange, Students recognized for imovie about the dangers of vaping at Olelo Youth Xchange Awards Gala <https://www.lanai96763.com/news/lhes-students-victorious-olelo-video-competition>
- Lokelani and Lahaina Inter participate in Math Counts competitions
- Maui Waena, Pukalani, Lahaina Inter and Lokelani Participate in VEX Robotics
- Maui Waena participates in Botball Robotics
- Maui Waena, Lokelani, Lanai High and Elementary, and Lahaina Inter participated in the 2019 Hawaii STEM Conference Competitions and Hack-a-thons. <http://womenintech.com/HawaiiSTEMConference/2019-winners/> (1) On-Site Voyaging Song Challenge Winners, (2) 60 Second Lab Tour- digital media, (3) ArcGIS Online US Competition, (4) Game Design, (5) Photography, (6) STEMworks Mascot, (7) Superhero CAD, (8) T-shirt Design Competition, (9) On-site Video Competition

In-Kind Physical Facilities:

MWIS (1 room, 4 days a week), LIS (1-2 rooms, 4 days a week), LHES (1-2 rooms, 3-5 days a week), PES (5-6 rooms, 4-5 days a week), Lokelani (4 rooms, 4 days a week).

Partnerships:

For the past several grant years, program participants have had access to learning from local industry professionals about relevant career pathways through experiences that include: Introduce a Girl to Engineering Day (IGED), Introduce a girl to Astronomy Day (AGAD), the Annual Space Exploration Day at AMOS, and the Hawaii STEM Conference. All industry partnerships utilize leveraged funding to connect students with hands-on engagement and career pathway connections alongside immersive site tours with industry for students and their facilitators. Specific Programs also have strong partnership with organization such as Maui School Garden Network, FFA (Future Farmers of America), VEX Robotics, Botball Robotics, Olelo Community Media, Math Counts, Hiko No and STN.

Additional Site-specific Partners and Volunteers below-

Maui Waena Community partners and volunteers:

- Two student course instructors were industry professionals: A Computer Scientist and an ongoing robotics mentorship from Electrical Engineer, Morikawa & Associates (150+ hours of assistance with robotics).
- Institute for Astronomy (IFA)- Students worked with astronomers to create videos about astronomy and light.
- BS, PBS Hawaii-Both PBS Student Reporting Labs and PBS Hawaii, provided valuable feedback on videos created by students for broadcast and web viewing.

- **Volunteers:** IFA’s Technology Education and Outreach Specialist at the University of Hawaii’s Institute for Astronomy guided students in research during the summer of 2018 and throughout the year (30+ hours of mentorship), two college students (totaling 30 hours), 4 high school students (totaling 320 hours), and two community member volunteers (industry professionals in engineering and computer science, totaling 180 hours).

Lahaina Inter community partners/volunteers:

- Jan 17- Lahaina Inter industry connection through a metallurgist from Pratt & Whitney conducted hands-on labs and spoke to the students about his educational background in material science, mechanical and welding engineering and his experience with designing and manufacturing jet engines for the military and commercial companies. One student expressed fascination with metallurgy after this experience and said it was something he was definitely interested in pursuing one day as a career.
- Jan, 29 – Lahaina Inter industry connection with a professional drone videographer from West Maui. He shared how he uses his drone and video editing skills to produce films for clients for weddings, special events, business promos and real-estate needs. He shared his experience with starting his own business, Media Flow Productions, and how he needed to obtain a Remote Pilot Certificate from the FAA in order to use footage for commercial purposes.

Lokelani Inter community partners/volunteers:

- Feb 14 Lokelani- As a part of a research unit on local photographers, the photography class had guest speaker and local professional photographer speak to the classroom students about the use of social media (pros and cons) as well as how to connect with people and know their story, to use storytelling in their work and not just take their photo.
- Across the year instructors used Nepris to connect students to professional speakers
- **Volunteers:** Two high school students supported by mentoring students in math, robotics and 3D printing classes (80 total hours)

Lanai High & Elementary community partners/volunteers:

- LHES College and Career Day (2018) was organized by the LHES Foundation; STEMworks™ supported finding professionals for event and site coordinator helped to support event organization; hands on activities and college and career booths that were led by industry, non-profits, and colleges to expose students to career pathways from across all islands.
- **Volunteers-** Drone Professional-Guidance in FAA rules, regulations and flight; LHES teacher attended and supported movie making camp with students

Pukalani community partners/volunteers:

- Peter Lin Graphic Designs (45+ volunteer hours)- taught graphic design class and volunteered additional time by guiding students in 3D printing projects.
- Maui Garden Network: Success with partnership: ‘aka Garden Mama’ brought her expertise to the campus to establish a thriving garden for participating students to learn in. In addition to learning the basics about plants, students developed a deeper understanding of environmental stewardship (“malama the aina”) in order to achieve sustainability.
- **Volunteers:** Two parents and one grandparent supported VEX robotics (150+ hrs total) helped students build and drive their robots and assist with STEM hydroponics research project. One King Kaulike HS Student (80+ hours total) co-taught a computer science and coding class for students as a part of a senior project.

3.F. STAFF AND OTHERS INVOLVED IN THE PROGRAM

Provide a brief description of staff and roles. Complete the following tables as they apply to your program. Totals will be automatically computed.

Title: Project Director

Number on staff: 1; Hours: 15 to 30 hours per week to support sites through phone/email communication, program planning for events, documenting activities, analyzing and summarizing data, and writing final reports on program activities.

Roles: Regular communication and support in record-keeping. Ensure timely communication and reminders to Project Coordinator of Sites and Site Coordinators regarding student attendance data, survey data, and self-assessment measures being completed. Provide professional development and training to all Site Coordinators to ensure adequate understanding of the processes and measures. Disseminate and collect school partner and community partner surveys. Participate in the program improvement meeting each year and in the identification of areas for improvement and development of associated strategies. Solicit feedback from site coordinators and consult with the external evaluator to understand contextual issues that might impact data or reporting. Work with the Site Coordinators to collect and handle data in a confidential way, adhering to Family and Educational Rights and Privacy Act guidelines. Maintain and enter data to state and federal systems as required.

Title: Project Coordinator of Sites

Number on staff: 1; Hours: About 20 hours per week to support Project director with sites through phone/email communication and site visits, program planning for events and family engagements, documenting activities, organizing, analyzing and summarizing data and site activities.

Roles: Support Project Director with regular communication and support in record-keeping. Ensure timely communication and reminders to Site Coordinators regarding student attendance data, survey data, and self-assessment measures being completed. Provide professional development and training to all Site Coordinators to ensure adequate understanding of the processes and measures. Disseminate and collect school partner and community partner surveys. Participate in the program improvement meeting each year and in the identification of areas for improvement and development of associated strategies. Solicit feedback from site coordinators and consult with the external evaluator to understand contextual issues that might impact data or reporting. Work with the Site Coordinators to collect and handle data in a confidential way, adhering to Family and Educational Rights and Privacy Act guidelines. Maintain and enter data to state and federal systems as required.

Title: Site Coordinator

Number on staff: 5; Hours: Weekly hours at MWIS, LHES, PES, Lokelani and LIS; averaging between 9 to 15 hours per week. Often, the Site Coordinator facilitates their class and overlaps with other instructor courses to co-teach and support as needed which averages about 5 hours per week.

Roles: Instructional and program planning; maintain accurate and clear attendance records for every student served, disseminate and collect evaluation surveys (teacher, parent, student), participate in the program improvement meetings each year and support identification of areas for improvement and development of associated strategies. Site Coordinators use the STEMworks model during teaching. Site coordinators also interview staff in the programs to identify at least one student or family success story per year to share with the Project Director for inclusion in annual reporting. Site coordinators work with the Project Director in planning engaging community nights for both students and families to attend.

Title: Site Instructor

Number on staff: 14-20; Hours: Varied by course taught. Some instructors supported activities that met less frequently whereas others taught classes that met daily. Thus instructor hours varied between 2 to 15 hours per week.

Roles: Uses STEMworks™ model, attends at least two PD sessions offered by Women in Technology, attends STEM Conference. In charge of course program planning, implementation and facilitating the learning of students, supports site coordinator in monitoring student progress, attends all parent evenings. Aligns site program with student needs (skills and in-school standards), collaborates with Curriculum coordinator and uses feedback to improve project alignment to STEMworks™ model. Sessions may include academic support for in-school subject areas. Collects daily student attendance, supports site coordinator in collecting documentation, and distributing forms. Documents program through supporting with monthly

project/curriculum summaries and photo-logs (images with descriptions). Supports in summarizing student success stories. Maintains timely communication with Project Director.

Title: Educational Assistant

Number on staff: 1-4; Hours: 8-12 hours per week.

Roles: Assists program instructors & coordinators; assists all students in projects, supports students' critical thinking skills using the engineering design process to research, implement, edit, and revise work; may sub as needed for absent instructors; attends all parent evenings. Maintains timely communication with Project Director. May attend PD sessions offered by Women in Technology, invited to attend STEM Conference.

Title: Volunteer

Number on staff: Varies; Hours: Varies

Roles: High school student or professional expert offering content support/guidance for students in STEMworks AFTERSchool™ labs.

Exhibit 9. Number of Staff by Position (18/19 combined and unduplicated)

Center	Administrators		College Students		Community Members		High School Students		Parents		School Day Teachers		Non-Teaching School Staff		Sub-contracted Staff		Other	
	Paid	Vol	Paid	Vol	Paid	Vol	Paid	Vol	Paid	Vol	Paid	Vol	Paid	Vol	Paid	Vol	Paid	Vol
Grant Management	2	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Maui Waena Intermediate	0	0	0	0	2	2	0	3	0	3	2	1	0	0	0	0	0	0
Lahaina Intermediate	0	0	0	0	0	2	0	0	0	0	5	0	0	0	0	0	0	0
Lokelani Intermediate	0	0	0	0	0	0	0	2	0	1	6	2	0	0	0	0	0	0
Lanai High and Elementary	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0
Pukalani Elementary	0	0	1	0	2	0	0	1	2	1	6	3	0	0	0	0	0	0
Subgrantee Total	2	3	1	0	5	5	0	6	2	5	20	7	0	0	1	0	0	0

Exhibit 10. Average Hours per Week by Position (Average per individual by position)

Center	Administrators	College Students	Community Members	High School Students	Parents	School Day Teachers	Non-Teaching School Staff	Sub-contracted Staff	Other
Grant Management	40+							1	
Maui Waena Inter			10	3		12			
Lahaina Inter						5			
Lokelani Inter						8			
Lanai High and Elementary						6			
Pukalani Elem.		4	4	4	8	10	4		
Subgrantee Total	40+	4	14	7	8	41	4	1	0

3.G. PARTNERSHIPS

Partnership Data

Enter subgrantee-level partnership data in the appropriate fields in the table below (note: partners do not include schools/centers).

Exhibit 11: Partners

Partner Contributions	Total Number of Partners	
	# Paid Partners	# Unpaid Partners
Provide evaluation services	1	
Raise funds		
Provide programming/activity related services	3	4
Provide goods		
Provide volunteer staffing		5
Provide Paid Staffing		
Other		
Subgrantee Total	4	9

Partnership Description

A. Provide a brief description of successes with partnerships.

Note: See above description of partnerships under “Resources.”

- IGED and AMOS have been consistent opportunities for students for several grant program years- all provided by leveraged funds, these opportunities are provided directly by these companies (and are all based at the site of the company/company meeting location). Consistent delivery is supported by strong alignment between the goal/objective of these industry partners and the 21st CCLC goal of increasing STEM career interest among pre-college students.
- Other partnerships change from year to year and have been driven by specific student projects. This year had many more hands-on guest speakers across programs in areas such as engineering, photography and aquaponics; two sites developed Math Counts teams, schools used the Nepris platform to connect to guest speakers, student’s projects in astronomy expanded at Maui Waena and led deeper connections with IFA.
- Ongoing parent volunteers from previous program years have grown their skills over time and are now full-fledged facilitators at Pukalani Elementary.
- Maui Waena, Lokelani, and Pukalani students have benefited directly from STEM industry connections in the classroom by having professionals as instructors for a semester or more: professional photographers, graphics designers, CAD designers, computer scientists and engineers. Lahaina Inter and Lanai High and Elem were both able to bring in professionals a guest speakers or mentors.
- Lanai continues to host a wonderful College and Career day each year that the STEMworks AFTERSchool site coordinator helps to organize in cooperation with the other 21st CCLC grantee on Lanai, to bring industry, non-profit and college representatives to the island.
- For agriculture at Lokelani and Pukalani there have been connections with the Maui School Garden Network, Grow Some Good and Future Farmers of America which all provide a many pronged support for garden programs and education.
- STEMworks is the regional partner for Code.org; programs with these three program facilitators (from MWIS and Lokelani) benefited from intensive summer training and quarterly workshops in computer science; all travel supported by STEMworks program.

B. Provide a brief description of challenges with partnerships.

Challenges with partnerships are very similar to the past several years:

- (1) The program has seen a benefit in student growth and career perspectives when having industry professionals teach STEM courses: over the past several years, the program has had industry teachers

across sites in the areas of: photography, graphics design, CAD & 3D print, drones, agriculture and computer science. However, each year the consistency in these ‘industry instructors’ has changed. It has been difficult to find professionals who are able to commit to more than 1-2 days a week or to assist for two consecutive semesters, or several consecutive years. This creates the challenge of finding instructor replacements mid-year or between years, and imposes limits on how many days a week students can receive instruction. It can also be challenging to coordinate the provision of support for industry partners from site coordinators in developing classroom management skills.

- (2) There is a challenge in finding partners to work directly with the most isolated schools (Lahaina and Lanai). Lanai is very remote and difficult to travel to, but has had support in drones and aquaponics/circuitry throughout various time periods in the grant from industry partners. Lahaina Intermediate’s campus is geographically removed from industry and it has been difficult for students to directly connect with industry partners during their program hours, but this past year visiting STEM professionals from the mainland, who were in the network of the Lahaina inter teachers, engaged students during activities afterschool to make direct career connections.
- (3) As seen in previous years, for opportunities where students are partnering with the community for digital media projects, sometimes industry partners were not as responsive and timely as students needed for their projects; sometimes the students were in need of more supportive feedback than partners were able to give to coach students with final products.
- (4) As in previous years, due to challenges with business/work hours overall, the program continued to plan and leverage successful industry to program connections, where many students are brought together to meet and learn directly from industry professionals all at one time for focused STEM hands-on activities (e.g. AMOS Space Exploration Day, Lanai’s College and Career Day, Excite Camp, IGED, and the Hawaii STEM Conference).

3.H. PARENT/FAMILY INVOLVEMENT

Provide a brief description of your program’s parent/family involvement component, including communications and outreach to parents and families, family programming and events, challenges and successes.

Methods of Parent Engagement:

Parent Input into program focus: Parent Surveys

Ongoing Information/Data Dissemination:

- **Flyers:** “By the Numbers” program data from 17-18 program year, site schedule, notices/event information given to families (All sites) and shared at MEDB board meetings and STEMworks conference events/presentations
- **Websites:** Lahaina Intermediate (<https://hi02225532.schoolwires.net/domain/18>), Maui Waena (<https://mwisstem.com/>), Lokelani (https://www.lokelani.k12.hi.us/197851_2/), and the STEMworks program (<http://stemworkshawaii.org/stemworks-afterschool-2/>)
- **Email:** All sites (especially Lokelani, Pukalani and Maui Waena). Parent emails are collected in the parent survey. Parents are also surveyed regarding whether they are able to volunteer.
- **School Newsletter:** Lokelani Intermediate
- **Quarterly Digital Newsletter (Mailchimp):** Maui Waena
- **Google Classroom/Forms:** Lokelani Intermediate, Maui Waena
- **Facebook:** STEMworks (<https://www.facebook.com/STEMworkshawaii/>), Lokelani School social media (<https://www.facebook.com/LokelaniSchool/>)

2018-2019 Parent and Community Engagements:

Lokelani (2018-2019)

- August – School open house. The STEMworks AFTERSchool program hosted a table where students and parents could learn more about the program and join. They also got to hear about the weekend workshops. The

robotics students did a demonstration of the current robots they had built (25 parents, 3 teachers, 1 WIT, 22 Students – specific for STEMworks)

- October – Girl Powered Workshop – This event is a leveraged funding event. This event is designed to help introduce students from the Kihei community (particularly girls and young women) to the various STEM-related employment and educational opportunities available to them. It is part of the month-long international celebration of women in technology (see <https://www.girlpowered.com/workshops/> for details). No experience necessary and no cost to attend. Participants younger than age 12 were accompanied by a parent or guardian. The workshops involved activities and design challenges to test problem-solving skills. (10 parents, 1 teacher, 16 students)
- October – LOIS attended the FFA pumpkin patch at Lahainaluna High School. (5 parents, 4 students, 1 teacher)
- December – Parent night. The photography students created and shared their portfolios of SBC's (letters in our surrounding). They practiced presentation skills showcased their digital work at the parent night. (42 parents, 13 program parents, 2 teachers)
- December – FFA students sold plants at Upcountry Farmer's Market in Pukalani (7 parents, 6 students, 1 teacher)
- February- Math Counts competition, one 4th place winner in countdown round (1 parent, 4 students, 1 teacher).
- January – FFA students participated in the Maui Districts FFA competitions at Lahainaluna High School (6 parents, 6 students, 1 teacher)
- March – Students participated in a community Garden workday event at Lokelani Intermediate School (2parents, 2 students, 2 teachers)
- March - FFA students promote worm castings and plants at the Upcountry Farmer's Market in Pukalani, sharing information and created cards where community could view information on a website that students are developing (7 parents, 5 students, 1 teacher)
- May – Parent participates as chaperone with the students for the Hawaii STEM Conference
- May – In partnership with Lokelani intermediate school, announce partnership with Boys and Girls Club for robotics in summer session, as well as registration for STEMworks with healthcare and GenCyber Cybersecurity camps during summer; students shared robotics and Ag activities (15 parents, 15 students, 5 community members)

Maui Waena (2018-2019)

- August – Parent night to show new and existing parents what the STEMworks AFTERSchool program at MWIS was about. The students led many of the activities, sign-ins, and fundraiser info stations. The parents were encouraged to finish all paperwork for the program and other activities that the students participate in. It was a great turn out of parents and the students seemed very excited to be a part of the program this year. (1 STEMworks, 2 teachers, 1 industry volunteer, 92 students, 90 parents)
- September – STEM Exploration Day- Hands on STEM Learning, parents and students explored the digital playground and took a class in video production, animation, coding, Photoshop, and game design taught by program students. (48 parents, 2 MWIS parents, 48 students, 2 teachers)
- December – STEM Exploration Day. Community joined the STEMworks AFTERSchool Program in learning about science, technology, engineering, and math in fun, hands on ways. Everyone from ages 4 and up were welcome. Activities included making family photos with self-designed borders and backgrounds for greeting cards, and making thermogenic slime and snow globes. (33 adults, 3 MWIS parents, 35 students, 1 teacher)
- December – STEM Exploration Day with Girl Scouts. STEMworks AFTERSchool students presented and taught the attending Girl Scouts in mini-classes about digital media, robotics, 3-D printing and more! (30 parents, 72 Girl Scouts, 1 teacher)
- January –Maui Waena student interviewed Governor Ige during program. Governor Ige visited the STEMworks AFTERSchool program to meet students and hear about projects.
- January – MWIS Parent night to discuss future plans for program sustainability. Also shared “By the Numbers”, “Site specific Q4 Survey from Spring 2018”, and “2017-2018 Annual Report”. (20 Parents, 19 Students, 1 teacher, and 2 STEMworks)
- January- Maui Waena robotics students shared their STEM skills, and their VEX robot, with parents and the community. Students also shared their STEM skills and projects with MEDB president and CEO, Leslie Wilkins and STEMworks Program Manager. (39 adults, 22 MWIS parents, 1 teacher)
- February –2nd Parent night to discuss future plans for program sustainability. Also shared “By the Numbers”, and “Full 2017-2018 Annual Report”. (7 Parents, 2 Students, 1 teacher, and 2 STEMworks)

- May – Students showcased their year of STEMworks. Students showcased videography, robotics and astronomy research projects. Students shared their short PSAs and films in a “red carpet” environment. Awards are given as students are celebrated for STEM and Employability skills. (48 parents, 57 adults, 80 students, 4 teachers)

Pukalani (2018-2019)

- September – open house with passports featuring hands-on STEM: 3D printing, Graphic Design, robotics, Math Matters and Science Olympiad teams, STEM stations featured STEMworks AFTERSchool activities. (90 parents, 90 students, 1 teacher)
- September – Junior Ranger program at Hosmer’s grove: Students learned about native species, adaptation and culture from National Park Educational Ranger while hiking through loop trail at Hosmer’s grove and tying in the class curriculum with place-based learning (12 students, 3 parents 1 teacher)
- October – Pumpkin Night, in partnership with PTO, students investigated the pumpkins circumference, height, and weight before and after carving, number of seeds, number of lines, and whether or not the pumpkin floated. (45 of parents, 49 of students, 3 teachers)
- October – Trunk or Treat at Kalama Intermediate School – The advanced robotics team from Pukalani Elementary did a service project for the upcountry community by passing out candies. The robotics team created a robot that kids could drive and scoop candies and deliver and dump them into a tower. The team members mentored the interested students and taught them how to use the variety of buttons and levers to move the robot. (10 parent volunteers for 2 hours)
- November – Science FEST Parent night. Program organized families attending to partner with Art and Rene Kimura from Future Flight Hawaii, Hawaii Space Grant Consortium. Students built brush bots and windmills out of recycled materials. The students also learned about circuits by playing with a light-up nose. The students also played with other simple items that utilized science. (47 parents, 47 students, 10 teachers)
- December: STEM night (120 parents, 15 teachers, 125 students) Rotated through the following sessions: Bottle Rockets, Math Talks – Mental Math Strategies and Computation, Science Fair Projects, Robotics STEM research projects, and robotics driving team, video produced by the Movie Making Team was shared with families, Parents were notified about the sign up process for semester 2.
- December- PES hosted the Maui League VEX IQ Robotics Competition Finale. 16 teams competed, over 150 students, 40 adults, 10 teachers, 100 parents attended this event
 - March – Pukalani School Leadership Day, led by students, invited the community to visit classes that are available during and after-school, including Service Learning--STEMworks AFTERSchool Program: Robotics/Project Based Learning Aquaponic Research, Movie Making, Garden and more. Day ended with a Round Table Discussion for the community to give feedback and ask questions.
- May – Students in digital media designed award certificates for all students who were regular attendees in the STEMworks AFTERSchool program. Award ceremony also recognized the students who designed Pukalani’s student leadership buttons and bumper stickers that are being used by parents, in addition to special recognition for the robotics team who made it to nationals.

Lahaina Intermediate (2018-2019)

- November – Parent Night at school open house. The students demonstrated robots that they built at the robotics program at a STEM booth. A slideshow presented pictures of activities that had been accomplished in the program that semester. Instructor did a short presentation about the program to parents and students. (15 parents, 24 students, 2 teachers)
- March - Ke Alii night, students ran hands on STEM booth, showcasing work and teaching parents and siblings in hands-on STEM activities, this is a part of a school community family night. (79 total parents, 11 are program parents; 49 total students)
- May - Family night to invite and welcome incoming students where current students demonstrated the drone technology and shared digital media products to incoming students to support interest in STEM clubs for next year. Students shared what they have learned in the program.

Lanai High & Elementary (2018-2019)

- October - Lanai High and Elementary College and Career fair (In partnership with Lanai community foundation), STEMworks AFTERSchool site coordinator supports organization for this event and STEMworks

team suggests outreach professionals to attend: student meet professionals from across the state to learn about college and career opportunities. Students preplan and rotate through stations they are interested in). STEMworks assisted with the organization for this event and reached out to professionals to attend so students had the opportunity to meet and talk with professionals across the state.

- May – Parent participates as chaperone with students for the Hawaii STEM Conference, including student presentations during STEMworks Spotlight, STEM sessions, and STEM awards.
- May – Community event showcasing STEMworks, school classes and the other 21st CCLC grant classes. (7 families).

2018-2019 Community Events/Presentations

- Sept 2018-May 2020 Kalama STEMworks AFTERSchool program supported by Kamehameha Education Foundation grant; based on 21st CCLC program success and data, MEDB was invited to apply to open the program at Kalama Intermediate. Lokelani site coordinator from 2016-2018 supported the new program opening and implementation at Kalama modelled after the original 21st CCLC STEMworks AFTERSchool program; ‘By the Numbers’ data reports have been shared with Kalama families.
- October- Afterschool Alliance Summit: Coding Breakout session presented by 21st CCLC project director; presentation included data from STEMworks AFTERSchool on grade improvement, career and professional skill improvement, and STEM pathway alignment. Hands-on session led participants through STEMworks THINKit curriculum for coding and prototyping with a micro:bit
- March – Pukalani School Leadership Day, led by students, invited the community to visit classes that are available during and after-school, includes Service Learning--STEMworks AFTERSchool Program: Robotics/Project Based Learning Aquaponic Research, Movie Making, Garden and more. Day ended with a Round Table Discussion for the community to give feedback and ask questions.
- April- Out of School Time Showcase on Oahu- facilitators from three schools and project director showcase best practices and data with STEMworks AFTERSchool for 21st CCLC, Uplinks and A+ out of school time groups. Everyone had opportunities for networking and idea sharing.
- May - Students from Lanai High and Elementary, Maui Waena, Lokelani and Lahaina Inter showcase their STEM projects during STEMworks Spotlight to industry partners, teacher and students (an audience of over 1000 attendees) at the Hawaii STEM Conference.
- May – STEMworks partnered with the school and another 21st CCLC grant for a community engagement evening to share STEM projects with parents and the school community council. (7 parents, 5 students, 2 instructors)

2018-2019 Local News/Published Information that Highlights Program

September – LIS, LOIS, MWIS, AMOS Space exploration day; 8th grade student quote, “Without MEDB I wouldn’t have had the opportunity to learn about satellites, telescopes, space, and its hazards. I am in the STEMworks™ AFTERSchool media production class and wouldn’t have the equipment to do my projects without what MEDB provides to us. Also, they offer amazing experiences that are helping us to expand our future choices for jobs in Hawaii.” LIS teacher quote, “I’m a much better teacher because of the tools MEDB and WIT have given me. My students are becoming more concerned about big global issues. Coming to AMOS increases understanding of STEM subjects and how they are applied to real world space-related issues.”

https://amostech.com/amos-2018-space-exploration-day/?fbclid=IwAR0ERdjU2r53BYA0vSi8e4j0c77xtLou_eUjmgBRo4CKOBQLu5Uc-caTdw

Maui Economic Development Board: STEMworks AFTERSchool Program data via ‘By the Numbers Flyers’- distributed at all events and with all partners including parent engagement evenings, MEDB board meetings, potential partner meetings and events, STEMworks and MEDB presentations and conferences.

4. Evaluation

4.A. EVALUATION PLAN

4.A.1. Evaluation Design Overview: *Provide a one-paragraph brief overview of the evaluation design.*

The evaluation plan includes survey instruments (Appendix A) and observation tools (Appendix B) to gather feedback from teachers, students, staff, parents, and community members regarding their experience of the program and its impacts; student performance in math, science, reading, and development in an array of core skills; student behavior; student perceptions and goals in STEM; and student development of leadership and teamwork skills. Via iResult (<https://hidoe-ce.datadesign.io/>), the program gains access to some data on standardized testing results, SED closing the gap results, daily school attendance results and more from participants though aggregated reporting at the state level. Data for the 2017-18 school year was first released in December 2018, functional data from iResults for SY18-19 was not available as of the writing of this report (See footnote 1, page 12).

4.A.2. Implementation Evaluation: *Describe how program implementation is documented.*

<p>Sample Implementation Questions:</p> <ul style="list-style-type: none"> ▪ Has the program been implemented as planned in the grant application? If no, what changes were made, and why? ▪ What challenges have been faced in implementing the program, and how are those challenges being addressed? ▪ Which community-based partnerships, as planned in the grant application, have been established and maintained, and which ones were not? Why? ▪ Are program activities interesting and valuable to students, teachers, administrators, and community partners? ▪ What are the plans to ensure effective program implementation next year? 	
<p>What implementation questions are being answered?</p>	<p>Has the program been implemented as planned following the last annual evaluation? Were there challenges to implementation and, if so, how were they addressed? Has the Continuous Improvement Plan produced any ideas for improving implementation? Are program activities still experienced as interesting and valuable to students, teachers, administrators and community partners?</p>
<p>What data collection methods are being used (e.g. interviews, observations)?</p>	<p>The program collects data via formal reporting regarding daily after-school attendance, workshop attendance, meeting notes/coordination and communication between in-school and after-school staff, contact and communication with parents, community outreach efforts, and program course content. Parents are surveyed at the beginning of the program year to inform program focus and students' needs. Students are surveyed twice per year: entry surveys support data on student interest, perceived strengths and needs; end of year student survey supports data success or area for program improvement (Note, for K-3 children, the parent's complete student survey with their child). Classroom course teachers are surveyed about student behaviors using the 21st CCLC teacher survey at the end of the year along with student course grades being compared from semester 1 to 2 in math, ELA and science. Facilitators working directly with students during afterschool time complete monthly summaries of the STEM activities and skill focus areas practiced and implemented during that month in their classes.</p> <p>Formal site observations are recorded on a summary sheet that is aligned with 21st CCLC program goals (see Appendix 1). The form captures anecdotal data and verifies activities aligned with program goals. Through communication with on-site</p>

	<p>teachers, the form also documents areas of success and identifies areas of need or follow ups needed for improvement.</p> <p>Informal site visits and communication occur between the formal site observations. These provide a venue for staff to voice their needs and suggest areas for improvement. Matters reviewed include program organization, data collection, staffing needs, supply inventory, orientation support on new supplies/software, meetings to align program with in-school courses and STEM, support with community connections or advice on projects and planning for parent engagement. Phone calls and emails are used to provide additional support as needed.</p>
What is the timing of data collection?	<p>Before the fall term, grant goals and annual evaluation recommendations from the program evaluator are reviewed and goals for individual site program improvement during fall semester program are defined. After the fall term, staff reviews survey data from parents and students, evaluates program successes and needs, and chose one or more focal areas at each site for improvement to be implemented in spring.</p> <p>Site observations are conducted at least once per semester. The completed form is provided to each site, along with summaries regarding noted areas of excellence, areas for improvement, and areas for support. All program staff participate in data collection, review and progress/improvement meetings each December/January. Site coordinators collect success stories during the year. Students are surveyed each semester and parents are surveyed each fall. Teachers are surveyed each spring.</p> <p>Via iResult (https://hidoe-ce.datadesign.io/), the program gains access to some data on standardized testing results, SED closing the gap results, daily school attendance results and more from participants though aggregated reporting at the state level. Data for the 2017-18 school year was released in December 2018. Functional data from iResults for SY18-19 was not available as of the writing of this report (See footnote 1, page 12).</p>

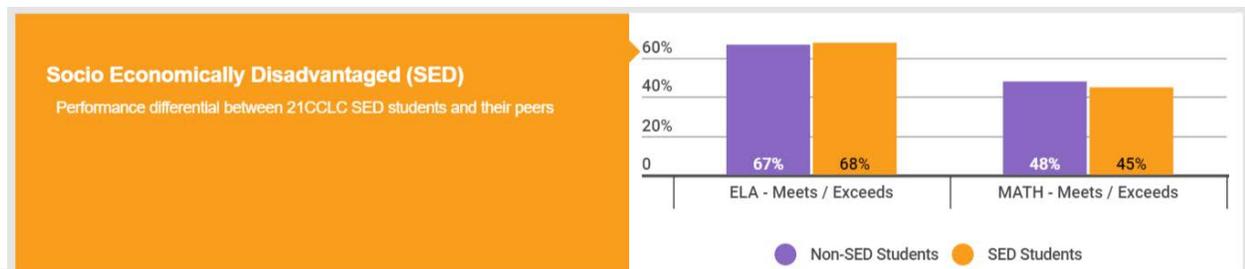
4.A.3. Outcomes Evaluation: *Describe how program outcomes are being evaluated.*

<p>Sample Outcomes Questions:</p> <ul style="list-style-type: none"> • To what extent do students who participate in the program show improvements in behavior? • To what extent do students who participate in the programs show academic gains? • To what extent has the program achieved its objectives? • What factors have affected program success? 	
What outcomes questions are being answered?	<p>To what extent do students who participate in the program demonstrate improvement academically?</p> <p>To what extent do students who participate in the program demonstrate improvement socially?</p> <p>To what extent do students who participate in the program demonstrate improvement behaviorally?</p> <p>In addition, the Program researches the following:</p> <p>How do students perceive their own strengths and areas for improvement?</p> <p>To what extent are students in the program interested in STEM careers?</p> <p>Are students progressing towards mastery of elements of the engineering design process?</p> <p>Are students progressing in their development of team-building and teamwork skills?</p> <p>To what extent has the program achieved its objectives?</p>

	What factors have affected program success?
For each outcome, what measures and data collection methods are being used (e.g. attendance, grades, behavior incidents)?	The evaluation plan includes survey instruments and observation tools (attached in appendix to this report) to gather feedback from teachers, students, staff, parents, and community members regarding their experience of the program and its impacts; student performance in math, science, language arts, and development in an array of core skills; classroom participation; student behavior; student perceptions and goals in STEM; and student development of leadership and teamwork skills. The iResults platform is also a tool being also used to capture some of these measures.
What is the timing of data collection?	Formal site observations are conducted at least once per semester and usually once per quarter. The completed form is provided to each site, along with summaries regarding noted areas of excellence, areas for improvement, and areas for support. As with implementation evaluation, before the fall term, grant goals and annual evaluation recommendations from the program evaluator regarding outcomes are reviewed and goals for program improvement are defined. After the fall term, staff reviews survey data from parents and students, evaluates program successes and needs, and choose two to three focal areas at each site for improvement to be implemented in spring. All program staff participate in data collection, review and progress/improvement meetings and site coordinators collect success stories in the spring semester. Students are surveyed each semester and parents are surveyed each fall. Teachers are surveyed each spring at the culmination of the program. Informal check-ins are also used to check in with program students, to ask what they are learning and working on in their projects. Informal site visits occur as often as needed, averaging about twice per quarter or more.

Other:

Reporting from the HI DOE via iResults in Spring 2018, showed that, within the population of students participating in MEDB programs, the achievement gap between SED and non-SED students was overcome (see graph below). Functional data from iResults for SY18-19 was not available as of the writing of this report (See footnote 1, page 12).



4.B. EVALUATION RESULTS

4.B.1. Implementation Evaluation Results

Describe the results of the implementation evaluation, addressing the implementation questions described in your response to [Section 4.A.2](#) above.

Has the program been implemented as planned following the last annual evaluation?

The program was implemented as planned, including follow-through on recommendations made in last year’s annual evaluation (SY 2017-2018) as follows:

- A. The program continued to increase the challenge/sophistication level of STEM offerings so that experienced students could continue to advance.
- B. The program continued to experiment with the balance of program reach (number of students) and curriculum depth at programs where demand outstrips capacity. At every site, students were given multiple opportunities to participate. Demand at Pukalani was again greater than capacity, but waitlisted students were given first preference in second semester and each child was given the opportunity to attend between 2 to 4 times per week. Additional weekend workshop were also offered to reach more students during quarter 1 and Quarter 4.
- C. The program experimented with providing students more feedback on their improvement to see if that would bring their self-assessments more into alignment with teacher assessments. However, results were similar to those seen in previous years: students' overall self-perception of improvement was lower than that perceived by teachers.
- D. The last evaluation recommended that the program adjust its data collection on family engagement to allow for reporting on the percentage of students who have family members attend (vs. simply the total number of family members engaged). This year the reported numbers of adults attending counted only those adults directly connected to students currently attending the program (vs. community members attending out of interest in program, teachers at the school attending to learn more about the program and support students, parents that were part of the school but not part of the afterschool program, and families attending to engage their child from another school (such as a feeder elementary school)). It is the evaluator's understanding that the raw data for determining the percentage of students who had family members attend was collected, however it was not processed and included in the data provided to the evaluator, so addressing this is included in the recommendations section.
- E. The program continued to evaluate the sustainability of continuing MEDB programming on Lanai in planning beyond the 2018-19 program year and the possibility of the need for culturally specific outreach. Efforts to improve attendance on Lanai did have an impact (more than doubling participation) but the viability of programming is still in question.
- F. The program continued to implement its evaluation plan as structured.
- G. The program continued to provide summarized data from survey instruments from each site to all staff from the respective site during informal site visits so that this information could shape the program and its delivery, including by further revising data collection instruments to best serve the goals of the grant and the individual sites.

After the April 1, 2019 Site Visit, the Community Engagement Branch (CEB) followed up on April 25th, 2019 and that evaluation concluded that the program had follow up actions for increasing site hours and servicing the targeted number of adults, a plan to address each area was communicated within the last month of program; the plan was accepted by the CEB office.

Specific site-identified challenges and how they were addressed:

Maui Waena Intermediate

1. ***Consistent 'production level' quality and content of projects.*** The goal is for all students to apply skills (technical and career/professional skills) to create quality content at a consistent level. It takes a lot of time (mentoring, feedback, practice for a depth of technical skills and revision) for all student teams to consistently have high quality products. The Program used student leaders/mentors, taught technical skills via mini-lessons, engaged students to give supportive critique of work in small and whole group settings and offered opportunities to showcase and share final products.
2. ***Depth and creativity with writing.*** Creativity and script writing is a constant struggle which seems to be effected by team inconsistency with daily attendance (due to other school opportunities: band practice/ukulele practice/math counts, etc.). An absence of a team member effects the group's ability to cohesively focus on clarifying, organizing and sequencing their ideas in writing. Additionally, the media that students consume on a regular basis (YouTube, vines, short format) has left them unfamiliar with traditional story structure. The program continues to work on this with focused lessons, example videos, and targeted discussion.

Lokelani Intermediate:

1. **Inconsistent attendance.** A portion of attending students are also engaged in band, where students become involved in additional concert practices, as well as sports practice. Sports especially impacts program attendance in the spring. The program is very supportive of students exploring many interests and being engaged in opportunities offered by the school. However, inconsistent attendance creates a gap in the depth of knowledge/skill which impacts teams' ongoing projects. In several cases, a key team member's absence, like those responsible for programming in robotics, greatly impact the ability to complete a project within deadlines. To overcome challenges of attendance, teachers continue to invite students back on days sports practice is not happening, or when sports are out of session, post site schedules around campus and continue to invite new and returning families during school sponsored family events.
2. **Staffing.** The program lost its site coordinator to a similar program at another school, and then the transitioning site coordinator (who had been with the program since its inception) passed away mid-year, which was an emotional as well as practical challenge to the entire program community.

Pukalani Elementary Challenges:

1. **Limited Offerings per Grade:** Fall program served Kindergarten through fifth grades and offered 10 courses overall each semester, however due to trying to serve all grades, each K-5 grade level did not have every area of STEM class offered. To support more opportunity and variety per grade level, and build in mentorship, all classes were open to at least two or more grade levels. Not every child was able to get their first choice and then chose not to attend, however many students who may not have had initial interest in the class ended up enjoying the area and expanded their interests. To overcome this challenge, students in the second semester who didn't get their first choice in the fall had priority for placement. The program also offered weekend camps, and invited students who were waitlisted from their first choice, to expose more students in the fall and spring to STEM areas of interest.
2. **Hardware Challenges.** The 3D printer had an irreplaceable broken part, but the instructor decided to create a lesson to design the part and have it printed using the King Kekaulike High School's 3D printer. The designed part fit and toward the ending of the fall semester, students were able to print their work! It was a great real life experience, however, the delay took away time from students and limited productivity as well as creating a delay between design and production.
3. **Behavior and Attendance Issues.** During fall semester there were several students whose behaviors were disrespectful to instructors and/or distracted other students. Ongoing instances occurred with non-teacher instructors who have not yet developed strong classroom behavior management skills. The program continues these partnerships with industry professionals as instructors and as well as college students in STEM majors, because they enrich skills development experiences for the students. However, for spring semester, disruptive students were placed with the teachers who were strongest on classroom management.

Lanai High and Elementary Challenges:

1. **Student Perseverance and Focus.** Peer mentoring is a strength of the program, especially with varied grade levels from second to seventh. This enables the program to have many individualized projects going at once. The downside of so many activities in the same space is that the students will begin a project, but then become easily distracted by another student's work or project, abandon their original task and begin on the borrowed idea. Thus there is a challenge to perseverance towards an original goal over time.
2. **Enrollment and Student Attendance.** Of the students who attended during the summer movie making engagement workshop, only two students continued in the Fall of 2018, but this opportunity did lead to in-school video production. During the second quarter, the main instructor needed extended medical leave and although a regular class continued, several students chose not to attend while she was out. In the third quarter students who attended were given priority to attend the Hawaii STEM Conference, and this enticement increased enrollment up to 15 students, and some of these new students asked to attend on Thursday and Friday, so the program was flexible in adding days to accommodate those students. Increasing enrollment and regular attendance has been a challenge over the grant period. Most students are involved in sports or attend to siblings at home after school.

Lahaina Intermediate Challenges:

1. **Homework completion:** Some students regularly say they had no homework, even if they did, but the daily set aside time support students in working on academics has helped greatly in having all students' complete work. The ability for student to digitally check in with their student grades also helps. In general attending students continue to do well in school and many would spend time during the program to work even beyond the initial period.
2. **On Task/Focus:** Although most students are on task and excited to learn new and varied STEM skills that they may not have explored in the previous year, a few students continue to struggle with focus, or off task behaviors (wanting to play video games instead of code). The weekly focused goal/activity structure has been helpful for some software activities.

Has the Continuous Improvement Plan produced any ideas for improving implementation?

Alignments to in-school academic needs for students and teachers at each site has been the best way to improve grant implementation, as it is a way to support long term sustainability of program and impact of program at each school setting. For the past few years, the ways that STEMworks AFTERSchool supports school improvement efforts for specific schools for both students and teachers are highlighted below. *Note-* The student or teacher support described below applies to all centers, but only the centers with that effort specifically listed on an improvement plan are highlighted below.

Supporting Students at sites in:

- Academic Achievement – ELA, Math, Science (LIS, LHES, Lokelani, MWIS, PES)
- On a path toward success in college, career & citizenship (LIS, MWIS, Lokelani)/ exploratory classes for middle school students, interest based (LHES, Lokelani)
- Student voice- student led design thinking modeling exhibition, engage in design thinking, peer feedback, learning opportunities for creativity and innovation with community, (PES, MWIS, Lokelani, LHES, LIS); student engage with annual leadership Symposium (PES)
- Positive, supportive and safe climate (LIS, LHES)
- Rigorous and well-rounded education (LIS, LHES)/Student engagement promoting deeper learning (critical thinking, problem solving) and student voice
- Interdisciplinary opportunities (LIS)
- Closing achievement Gap (high needs and their peers) (LIS, LHES, MWIS)
- 7 Habits of Highly Effective People integrated in program (PES)/Character Education Program via counselor (LHES)
- RTI behavior/academic support via summer program (PES)
- Career Days (Lokelani)/ Content related field trips to demonstrate relevancy of curriculum (MWIS)
- Continue to offer STEMworks AFTERSchool program where students will utilize high-end technologies in service learning projects, stimulating interest in science, engineering, and math. (Lokelani)
- Increase 1-1 iPad use with academics (Lokelani)
- Greater rate of inclusion to increase academics of SPED students (MWIS)
- Supplies to utilize online software and programs including google drive, STEM supplies and resources (MWIS)
- Parent and community nights and increase parent communication by using digital tools (MWIS)

Supporting Teachers at sites in

- Professional development aligned with Ha Framework (Lokelani, LIS)
- Professional development in project based and interdisciplinary use of toolkits, curriculum, and use of industry tools aligned to standards (NGSS engineering design, Common core ELA, Ha Framework, CTE, ISTE technology standards). Professional development in Core.org (aligned to CSTA standards). (LIS, PES, LHES, Lokelani, MWIS)
- Learn about workplace and industry changes (LIS, PES, LHES, Lokelani, MWIS)
- Professional development in how to engage students in student centered innovation (LIS, LHES)
- Professional development integrating visual arts (digital media) (PES)
- Provide adequate and expanded resources for student growth and needs (LIS, LHES)
- Attend ISTE conference to support 1-1, STEM, PBL (Lokelani)

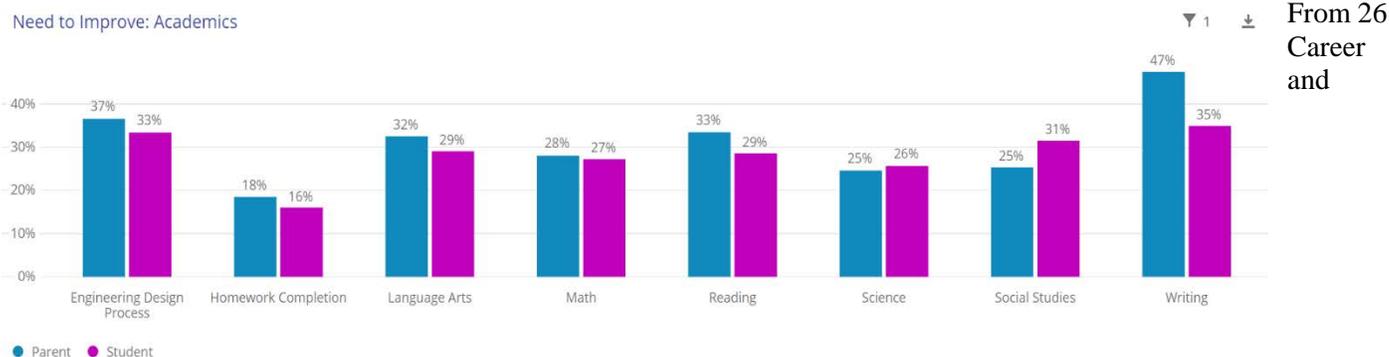
- Data driven decision making by teachers (Lokelani, LHES)
- Build tangible connections between school and community (MWIS)

To improve academic implementation at school sites, requests from some sites were granted to share STEMworks AFTERSchool program with WASC visiting team (Observation, data, and reports with WASC visiting team). Some program facilitators have also had direct responsibilities with school improvement, which helps the grant to align even more closely with school needs:

- *Two Lahaina Intermediate STEMworks AFTERSchool facilitators have responsibilities to report on indicators*
- *Two Pukalani Elementary STEMworks AFTERSchool facilitators have responsibilities to report on indicators; both site coordinators support with RTI at Pukalani Elem (math and reading interventions). Parent who teaches robotics is also the head of the school's PTA.*
- *One Lanai High and Elem STEMworks AFTERSchool facilitators has specific duties cited in plan*
- *Four Lokelani Intermediate STEMworks AFTERSchool facilitators/volunteer have/had responsibilities in plan implementation*
- *Recent WASC visit with Maui Waena included interviews with many students who happened to also be in the STEMworks AFTERSchool program (March 2019 visit); initial informal conversations with our site coordinator said they recommend that the program is great for students and that it should continue.*

Parents and students were surveyed at the start of the program year to inform program focus. In all three figures below, both parents and students chose similar results for areas of needed improvement. In figure 1 below, for academics, both writing and using the engineering design process showed up as the most needed improvement chosen by both parents and students. Math was not a top choice of surveyed students or parents as an area needed to improve, but based on need demonstrated by Hawaii state testing data, it was included as a focus area.

Figure 1 below: Academic areas ranked by needed to improve by both parents and students



Professional Skill choices, Figure 2 is organized by the student's top 8 areas of identified need and Figure 3 is organized by the parent's top 8 areas of identified student need. Both students and parents identified the need for six common areas: communication, presentation, confidence, staying focused, leadership and organization as being in the top 8 of needs. Students, however, were more concerned with improving their ability to make friends and increase artistic abilities; whereas their parents wanted to see more improvements in researching and self-motivation. Each school site chose 2-3 site-specific focus goals based on priorities for their student populations.

Figure 1 (Below): Of 26 choices, these are the top 8 identified areas of need as ranked by students for themselves.

Figure 2
26
these are
identified
need
parents
child.

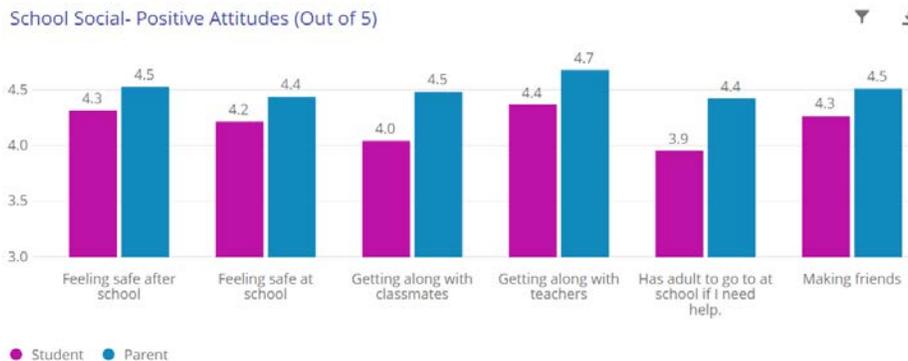


(below): Of
choices,
the top 8
areas of
ranked by
for their



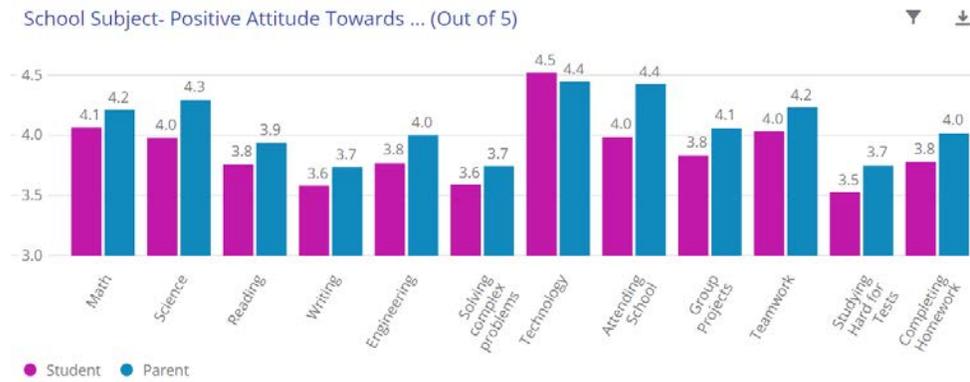
Figure 4 and 5 show outcomes from students and parents about their feelings about school to help determine areas for extra support at the beginning of the program year. Note that 4 out of 5 would be 80% having a positive attitude, meaning that overall scores for school related feeling were high. However, there was a general trend that parents had a more positive outlook on school related behaviors than that their child actually felt. In Figure 4, the biggest spread in data occurred between “getting along with classmates” and “having an adult they go to at school if they need help.” The program responded by directing the program facilitators to attend to building positive student-teacher relationships to help students have an adult to go to, and to provide practice with support for students to collaborate in their teams.

Figure 4: Parent and Students rank their feelings on school social aspects.



In Figure 5, the largest spread between parents and student’s attitudes was in attending school, again with parents holding a more positive view than students. For many students, the program became a draw and motivation to attend school and do well in their classes. It was not surprising that writing, using the engineering process (EDP) and solving complex problems scored especially low, as these were areas that were also identified as being highly needed to improve by both parents and students. Writing also became a program focus; EDP along with solving complex problems was built into each day. Studying for tests also scored low, so the program encouraged students to form study groups this year.

Figure 5 (below): Parent and Students rank their feelings on aspects of school subjects/academics.



Based on feedback from parents and students, along with program overarching goals, each site chose site-specific Focus Goal(s) for Student Improvement during SY18-2019:

Maui Waena Intermediate: (1) Communication and (2) Writing Skills. Script writing was the primary focus for developing communication skills while applying effective use of technology.

Lokelani Intermediate: (1) Connect projects to purpose to help increase the quality of work. Students were supported in identifying the purpose driving their work, and considering this as they determined quality. For example, a photography student may purposefully take portraits to share a story, expanding their focus from the technical skills to thinking of the effectiveness of each image in portraying the story. **(2) Industry career connections.** The program utilized the Nepris platform for bringing professional speakers virtual in the classroom to make connections to STEM careers.

Pukalani Elementary: (1) Communication and (2) Writing Skills. Each quarter, the grade levels focused on one type of writing to teach and improve on: Narrative, Opinion, or Informative. Students were assessed and guided on Development, Organization, and Language/skills. To give more practice and application in these areas, students in all classes engaged in a Learning Log, Engineering Design Notebook, or Journal to document their thoughts, ideas, experiences and/or learning during Spring session. This practice provided time for students to reflect on and debrief their learning to improve their overall communication skills for success during the school day.

Lanai High and Elementary: (1) Improve perseverance and focus and (2) Sustained attendance. The program supported students in staying on task longer through hands on learning. Hands-on STEM focus areas included work with drones and computer science, including more practice with coding via code.org. The ability to navigate and focus during online learning is also one of Lanai High and Elementary School’s in-school academic goals for students. The program worked on sustaining and increasing attendance through sharing about Hawaii STEM Conference opportunities with middle school students and supporting their work on STEM competitions/projects during program to attend as well as through community STEM events to excite students and their families.

Lahaina Intermediate: (1) Continuing to expand student interest in a larger variety of STEM areas through supported exploration and (2) Improving academic grades. In the Fall of 2018, the program used weekly or biweekly focal areas of STEM for each set of instructors, so that attending students would be exposed to a variety

of areas. Each area was explored through specific activities and projects. In this way the program moved from less structure (of individually self-directed student pursuits) to a more defined schedule that supported students in finding new areas of interest. Second, the program continued to set aside a structured time for supporting students in academic areas with their homework at the beginning of the session (some students spent more time continuing homework if they needed to). Whenever possible the program also included skills and activities that aligned with in-class academics, for example, a math counts math club program continued, which directly supported in-school work.

4.B.2 Key Performance Indicators (KPIs) – Objective 1

Objective 1: Participants will demonstrate educational and social benefits and exhibit positive behavioral changes.

Exhibit 12: Performance on KPI Objective 1 – Turning in Homework and Classroom Participation

Objective 1.2: Percentage of REGULAR program participants with teacher-reported improvements in turning in homework and participating in class.	
Center	Percentage of REGULAR program participants with teacher-reported improvement in turning in homework and classroom participation (INSERT ONLY ONE PERCENTAGE FOR EACH CENTER)
Maui Waena Intermediate	96%
Lahaina Intermediate	88%
Lokelani Intermediate	80%
Lanai High and Elementary	100%
Pukalani Elementary	99%

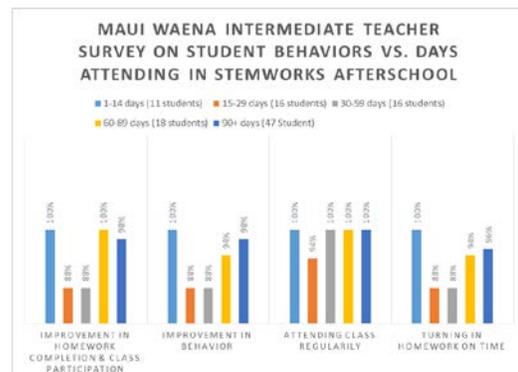
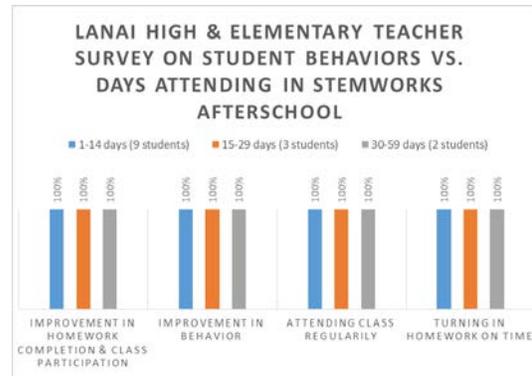
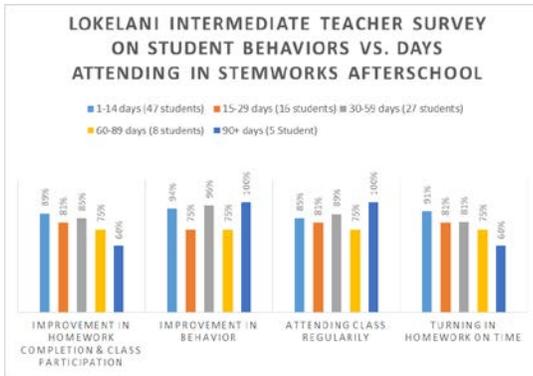
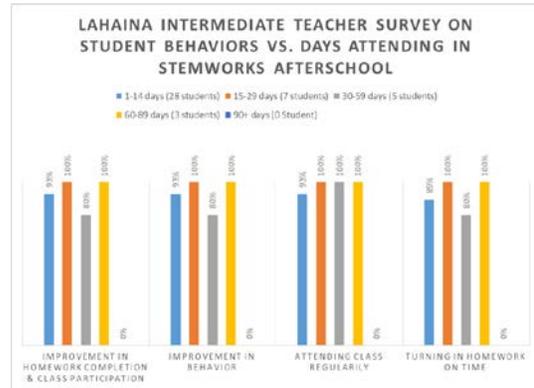
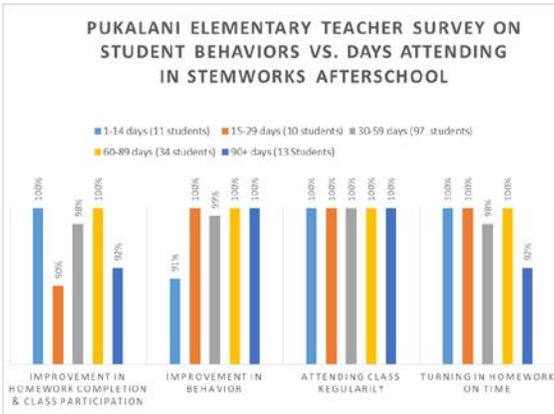
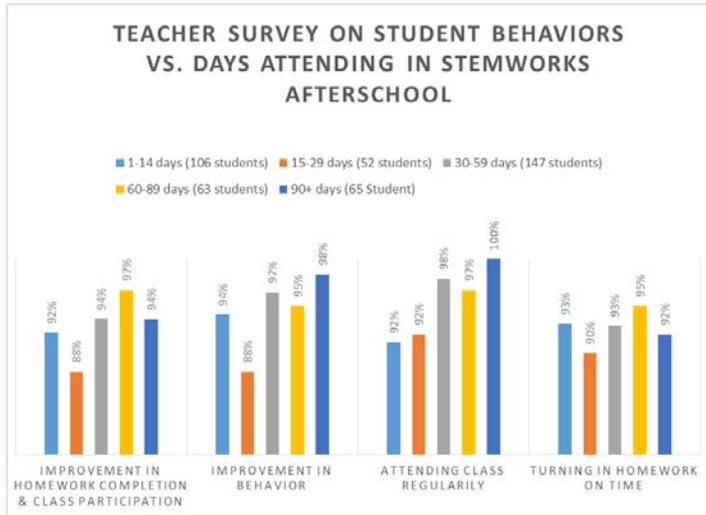
Exhibit 13: Performance on KPI Objective 1 – Student Classroom Behavior

Objective 1.2: Percentage of REGULAR program participants with teacher-reported improvement in student classroom behavior.	
Center	Percentage of REGULAR program participants with teacher-reported improvement in teacher-reported student classroom behavior
Maui Waena Intermediate	95%
Lahaina Intermediate	88%
Lokelani Intermediate	92%
Lanai High and Elementary	100%
Pukalani Elementary	99%

KPI Objective 1 Discussion: *Please describe particular successes related to Objective 1. What data/evidence are these success and challenges based on?*

A. Math or ELA teachers were surveyed for each student in Program to report on student behaviors in in-school classes:

Based on the end of year teacher surveys, the graph shows the pattern across the sites. In all cases, a high percentage (minimally 88%) of attending students showed improvement in all four measured areas, with those attending the program for at least 30 days showing more improvement in behavior and attending class regularly. Only Pukalani, Lokelani and Maui Waena had students attend 90+ days.



B. Site specific reflections from instructors on how program supported homework, participation and classroom behavior is noted below.

Maui Waena

1. Homework completion: As in previous years, students were encouraged to form study groups and regularly helped each other understand concepts and complete work. The only challenge was that there were often students who didn't have homework, but since all students had a scheduled time set aside at the beginning of every class to complete homework, students worked in peer-led tutoring groups based on the needs of the group. For instance, if students were having a hard time with a certain math topic, other students who had a better understanding of the concept would help. This was very effective for students and promoted peer mentorship and academic success
2. Participation: Here the challenge was group members leaving early or being absent, especially during band practice season. Despite this challenge, students were able to make all group members feel a part of the group. Groups learned how to assign tasks based on what students were best at and what days they attended. New students were mentored by experienced students, which built relationships as well as participation skills. Students worked in small teams where each person had a role, thereby helping students practice daily participation in projects.
3. Classroom behavior: Students range between 11-14 years of age and still learning to make decisions that are supportive of themselves and the group. Clear behavioral expectations and the example set by teachers, guided the students to peer-monitor and help each other make appropriate decisions.

Lokelani Intermediate:

1. Homework completion: As in previous years, the program had a routine for the teacher and students to set aside homework time before STEM classes began. Grade checks once a month were helpful to make sure students were keeping up with their daily academic responsibilities.
2. Participation: Returning students were involved and initial summer and fall open houses and in-school announcement/meetings supported new incoming student attendance. Summer session also involved many incoming 6th graders, which increased immediate enrollment into the fall program. Most students self-opted into the program are very engaged and participate effectively. Students whose parents opted them in tended to be less involved. In the spring attendance dropped, teachers personally invited students, but many students were engaged in sports practices.
3. Classroom behavior: As in previous years, it worked well to set clear expectations and protocols. The students know their roles and expectations in the classroom environment for responsible supply use and responsibility to their teams. The protocol for negative student behavior is to contact home and communicate with the student and family to review the expectations.

Lahaina Intermediate

1. Homework completion: A daily time was set aside at the beginning of the program day for students to work on academic work. Instructors would double check if students needed to work on grades. Having this time helped students work on academics with less struggle (some students always said they had no homework, but of course still had subjects to work on).
2. Participation: A core of about 15 students were regular attendees to the program and many of the students had been in the program for their whole middle school experience. Mentorship between students grew, sharing their knowledge with other students, especially in digital media, computer aided design and 3D printing. In the spring, attendance dropped, and teachers did personal outreach, but many students were engaged in sports practices.
3. Classroom behavior: The program has not faced challenges in classroom management. Every year the program has struggled, instead, with providing a creative environment vs. too much structure. This year a balance was found between the two and students completed many long-term projects, and entered several final products into the Hawaii STEM Conference competitions as well as got their first episode aired on Hiko No about the Lahaina Crossfit Kids Deserve to Thrive program.

Pukalani Elementary

1. Homework completion: The site coordinators are a part of RTI at the school, and pulled students for support in academics as needed. Journaling about activities to increase writing was also built into program and

applied math concepts were included across content. Pukalani Elem has exhibited huge progress in the past three years on standardized tests scores in math, ELA and science. Whenever a homeroom teacher shares a concern about an afterschool program student's homework incompleteness, after school directors made it a point to talk to the student about the importance of this responsibility. They worked with him/her and utilized afterschool time to work on their incomplete assignments. Directors emphasized the importance of school work first, before after-school activities. Most students didn't want to miss their after-school activities, so they did better with their homework completion. Challenges: Not all teachers communicate with directors. Success: The directors know most students who struggle and are in direct communication with their teachers. Teachers appreciate that students are held accountable and time during the after-school hours are used to support these students, especially with students of families who struggle to improve the situation from home.

2. Participation: At the beginning of each STEMworks after-school session, a mandatory parent meeting was held. At this meeting instructors were introduced and were given the opportunity to share the activities and lessons that students would be engaged in. In addition, the after-school directors took the time to go over the importance of consistent attendance. Challenges: There was a lot of interest in the lower grades (K-2) to participate in the program. However, most of classes were geared to older students so many of the younger students did not get into those classes. To address this issue, the program added extra students to the K-2 classes (which may have compromised effectiveness). There were also many time conflicts with other after school activities (basketball, Math Matters, tutoring, drama) happening during the school year which caused some of the students to miss classes. Success: The K/1 students were especially excited about their STEM classes which resulted in nearly full classes each day. Many parents shared that their children talked nonstop about their STEM classes. The 3D printing, movie making and advanced robotics classes had an especially big impact. The students were fascinated by the 3D printer. Students came by just to watch the prints being made, and students who were not participants this year expressed a desire to attend in the future. The students in Movie Making and Robotics developed many technical and professional skills. Parents of these children noticed a positive change in their confidence levels and communication skills.
3. Classroom behavior- Most instructors were not classroom teachers and lacked strong classroom management skills. At the mandatory parent meetings, parents were informed that their child would be dismissed from attending the after-school program after two disrespectful incidences. Success: Rather than release the student from the program immediately, other instructors agreed to take troubled students into their sessions. Most often this change gave the student another chance to succeed in another setting. Students found the STEM content to be very engaging which greatly reduced student misbehavior. One autistic student found her voice in the garden class! She really blossomed in the garden and found a place where she felt she belonged.

Lanai High and Elementary

1. Homework completion: As in previous years, students checked in with instructor on their homework and received support first. Some students came just for homework.
2. Participation: As in previous years, students gained confidence in their STEM skills and being able to collaborate with students of various ages. It was a unique opportunity to have all ages work together. Low program enrollment was an ongoing issue, as was having students attend inconsistently. In the spring semester, attending middle school students were offered the first opportunity to travel to the Hawaii STEM Conference, this increased some regular attendance, and some students asked if they could attend on the days the program was not in session, so Thursday and Friday were added to accommodate those student's schedules.
3. Classroom behavior: There were no issues. When attending, students were excited, engaged the whole time and involved in team activities or receiving support with homework.

Please describe particular challenges related to Objective 1. What data/evidence are these success and challenges based on?

Common Challenges This Term for Maui Waena, Lokelani and Lahaina Intermediate: *Inconsistent attendance.* Spring sports are very popular and students become involved sports practices. The program is very supportive of students exploring many interests and being engaged in opportunities offered by the

school. However, inconsistent attendance limits the depth of knowledge/skill which impacts team’s ongoing projects.

Additional Challenges by Site:

Pukalani Elementary: *Limited Offerings per Grade:* Spring program served Kindergarten through fifth grades. To support more opportunity and variety per grade level, and build in mentorship, all classes were open to at least two or more grade levels. However, multiples of each STEM course could not be offered. Thus, although there were more options per grade level, upon registration, not every child was able to get their first choice. Due to special needs of young students, there was only one only one class for Kindergarten students, which limited enrollment opportunities. At the beginning of program some students were less excited about the class as it may not have matched their initial interest and a few decided not to attend, however, as seen in years’ prior, many students who may not have had initial interest in the class ended up enjoying the area and expanded their interests. ***Behavior Management:*** Because classes are filled by the lottery process, classes were comprised of students of varying degrees of need and often grade level. Some of the students had extreme behavioral challenges and required full-time adult aides during the day. Those aides did not accompany the students STEMworks classes so the students had to work independently. The STEMworks instructors, (some of who were never trained in classroom management) had to learn to manage these students as well as other challenging students. Our garden instructor communicated some management issues. Almost half of her class were SPED/504 students and having an outdoor classroom was highly stimulating for them. Her classes on Wednesdays were 2 hours long and it was difficult to keep some of the students focused for that time period. Fortunately, this instructor was able to make adjustments (varied class settings from outdoors to indoors and planned student-led projects that were engaging and hands on) and behaviors improved.

Lanai High and Elementary: *Enrollment and Student Attendance.* In the third quarter students who attended were given priority to attend the Hawaii STEM Conference and this increased enrollment up to 15 students, and some of these new students asked to attend on Thursday and Friday, so the program added these days to accommodate them. Increasing enrollment and regular attendance has been a challenge over the grant period. Prior surveying revealed that most students are involved in sports or caring for younger siblings at home after school.

4.B.3 Key Performance Indicators – Objective 2

Objective 2: 21st Century Community Learning Centers will offer a range of high-quality educational, developmental, and recreational services.

Exhibit 14: Performance on KPI Objective 2 – Core Educational Services

Objective 2.1: Centers will offer high-quality services in at least one core academic area, such as reading and literacy, mathematics, or science. (Click Yes or No for each academic area)				
Center	Reading & Literacy	Math	Science & Technology	Other (specify)
Mauui Waena Intermediate	Yes	Yes	Yes	Math Concepts: CAD, 3D printing, coding; ELA: Project Research and Script Writing, Sequencing and Editing; Homework Support
Lahaina Intermediate	No	Yes	Yes	Math Concepts: CAD, 3D printing, coding; ELA: Project Research and Script Sequencing and Editing; Homework Support
Lokelani Intermediate	No	Yes	Yes	Math Concepts: CAD, 3D printing, coding; ELA: Project Research and Script Writing, Sequencing and Editing; Homework Support
Lanai High and Elementary	No	Yes	Yes	Math Concepts: CAD, 3D printing, homework support; ELA: Project Research; Homework Support
Pukalani Elementary	Yes	Yes	Yes	Math Concepts: CAD, 3D printing, coding; ELA: Project Research and Script Writing, Sequencing and Editing; Homework Support

Core Educational Services Discussion: *Provide a brief description of evidence that these services are of high quality.*

The Program curriculum and approach are largely project-based, in recognition of the evidence that this method is highly effective. Project-based learning is a form of problem-based learning (PBL) that focuses on the student’s ability to gain knowledge and skills by working on a complex question or problem. Strobel and van Barneveld (2009) in their meta-analysis of several studies comparing problem-based learning to conventional classrooms report distinct benefits in the effective implementation of this pedagogical practice. As summarized in the paper (pages 34-35), these benefits would include:

- Enhanced professionalism and collaboration on the part of students and teachers, increased attendance, self-reliance, and improved attitudes towards learning on the part of student
- Gains in general academic achievement and for developing lower-level cognitive skills in traditional subject matter areas.
- Improvement in performing complex processes such as planning, communicating, problem solving, and decision making
- Enhanced quality of student learning in subject matter areas leading to the tentative claim that learning higher-level cognitive skills via PBL is associated with increased capability on the part of students for apply those learnings in novel, problem-solving contexts.

These and other studies (e.g., Walker and Leary, 2009; Wiesman and Cadwell, 2005) demonstrate the effectiveness of PBL at various educational levels.

The program also works diligently to provide students hands-on experience with the latest technology (e.g. drones, 3D printing). In addition, the program has or is progressing towards all elements of a high-quality program delineated by the National Center for Research on Evaluation, Standards and Student Testing. The program has clear and rigorous goals that are supported across the program in both structure and content. Funding is generally adequate to support these goals, although increased funding would be helpful at Pukalani, where demand far outstrips capacity. Leadership is increasing in experience and longevity, are well-educated, and employing a bottom-up management style that seeks and applies input from staff. Staff has increasing experience and longevity at their sites, relate well to students, model high expectations, motivate and engage students, and work well with leaders, colleagues and parents. The program aligns to in-school curriculum, provides time for students to study, learn and practice; includes motivational activities, and frequently uses technology, science and the arts to support youth development, student learning, and engagement. Program evaluation uses both internal (formative) and external (summative) methods. Evaluative information and data accurately measure goals, and results are applied to continuous program improvement.

Exhibit 15: Performance on KPI Objective 2 – Enrichment Activities

Objective 2.2: Centers will offer enrichment and support activities such as academic assistance, remediation and enrichment, nutrition and health, art, music, technology, and recreation. (Click Yes or No for each enrichment area.)						
Center	Arts & Music	Physical Activity	Community Service	Leadership	Tutoring/ Homework Help	Other (Specify)
Maui Waena Inter	Yes	No	No	Yes	Yes	STEM & Technology
Lahaina Inter	Yes	No	No	Yes	Yes	STEM & Technology
Lokelani Inter	Yes	No	No	Yes	Yes	STEM & Technology
Lanai High & Elem	No	No	No	No	Yes	STEM & Technology
Pukalani Elem	Yes	No	No	Yes	Yes	STEM & Technology

Exhibit 16: Performance on KPI Objective 2 - Services to Parents and Family Members

Objective 2.3: Centers will offer services to parents and other family members of students enrolled in the program.		
Center	Number of parents/ family members participating	Description of services to parents and other family members.
Maui Waena Inter	101 parents/ grandparents/guardians (reached 93%; 41% attended multiple times)	Hands-on STEM family engagement evenings and several community based Saturday STEM days with presentations/booth led and taught by program students.

Objective 2.3: Centers will offer services to parents and other family members of students enrolled in the program.		
Center	Number of parents/ family members participating	Description of services to parents and other family members.
Lahaina Inter	19 parents/ grandparents/ guardians (reached 43%; 26% attended multiple times)	Hands-on STEM family engagement evenings in coordination with school events, STEM presentations/booths were led and taught by program students.
Lokelani Inter	59 parents/ grandparents/ guardians (reached 57%; 49% attended multiple times)	Hands-on STEM family engagement evenings in coordination with school events, STEM presentations/booths were led and taught by program students.
Lanai High & Elem	8 parents/ grandparents/ guardians (reached 50%; 13% attended multiple times)	Two community events and parent chaperone participating in Hawaii STEM Conference.
Pukalani Elem	212 parents/ grandparents/ guardians (reached 100%; 29% attended multiple times)	Hands-on STEM family engagement evenings and showcases after workshops. Note: Many families, beyond those in the program, came to engage in the hands-on STEM family engagements.

Parent/Family Services Discussion: Provide a brief description of successes in providing services to parents and other family members.

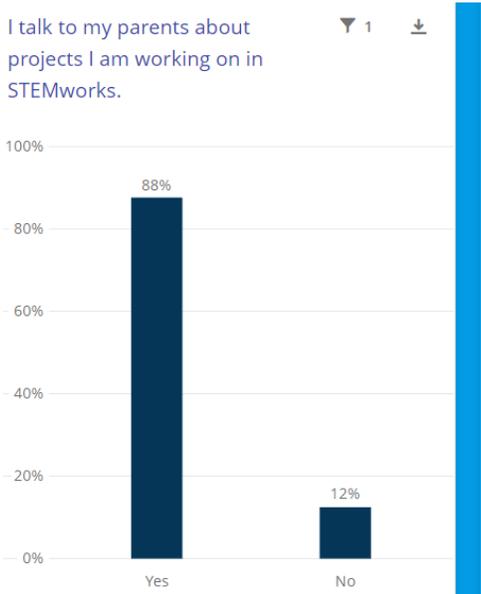
Successes with Parents on program and family events:

Over the past several years of the grant, the program has learned that the most successful parent events are those that are student-centered. Accordingly, parent events included hands-on STEM stations and formal group presentations that were planned and delivered by students. Parent engagement began with overall sharing from program instructors to deliver information or updates, but the main focus was the students. Having students present also gave them an opportunity to practice communication and presentation skills. It was also helpful to partner with school/community related events, as many parents attend those functions. So, as in previous years, this was the strategy to reach Lahaina inter and Lanai families. Overall, about a third of adults connected to a student in the program, attended multiple events.

Families additionally have direct impact on program focus and improvement, providing multiple ways to connect families with program.

Family STEM Engagements 18-19*		Program Parent Survey 18-19*		Students Talk to Parents about Projects 18-19*	
Overall, 91% of parents attended hands-on STEM engagements with student presentations.		Overall, 54% of parents completing program entry survey during Fall 2018 used to inform/improve program.		Overall, 88% of students talk to their families about STEM projects/activities.	
Maui Waena	93%	Maui Waena	61%	Maui Waena	88%
Lahaina Inter	43%	Lahaina Inter	98%	Lahaina Inter	76%
Lokelani Inter	57%	Lokelani Inter	22%	Lokelani Inter	81%
LHES	50%	LHES	0%	LHES	67%
Pukalani Elem	128%	Pukalani Elem	63%	Pukalani Elem	93%

*these figures represent the total number of attending family members divided by the total number of participating students



At home with parents, relatives or friends I've talked about....

Sources	Top Box / Bottom Box
Working in a STEM career	80.54%
Graduating college	86.29%
Apprenticeship/Trade School Training	63.08%
Having an Internship	64.29%
Graduating High School	87.94%
Earning Good Grades	98.71%
Completing Homework	95.35%

Having students share directly with their parents may have encouraged ongoing overall sharing about program activities. 88% of program students reported that they talk to parents about program activities. This year the grant also broke down other ways students may or may not talk with families about success and future success. We found that 95% of students report talking with families about homework, 88% discuss graduating high school (our program is K-8), 86% discuss graduating college, and 98%

discuss earning good grades with families.

By the Numbers- Program Data Snapshot Flyer

Parents gave positive feedback about the ‘By the Numbers’ infographic, which had been improved from the previous program years (feedback from parents included wanting to see site specific data in academic improvement which was added in the 16-17 year). This was a good way for families to see the impact the program had on school academics and career and professional skills, and to help new families understand the impact the program could have on their student’s success.

The program used multiple modes of communication to reach parents in a timely manner as described in section 3.H of this report.

Provide a brief description of challenges in providing services to parents and other family members.

Maui Waena, Lokelani and Pukalani- Very minor communication challenges: sometimes flyers sent home with students did not make it into the hands of parents, or parents did not check email/e-newsletters. However, program had parent contact info and was able reach families via email/text as needed.

Lanai High and Elem- Working with school and community events seemed to the best way to engage adults this past year. Despite advertising, the program teachers believe that there is still a limited community understanding of the importance of STEM. In the first grant year, when program enrollment was larger, all family hands-on nights included full meals and the support of hands-on engagement with the traveling STEMworks team. The hope was to invest early into sharing the importance of STEM and program opportunities with families to provide a solid understanding of program early on, to engage families and students long term. However, the outlay of resources for these events was not deemed sustainable. (Note: no 21st CCLC funds were ever used to provide food.) Parent surveys were difficult to collect, several copies went to families with both paper and digital options, but did not return.

Lahaina Inter – Over the past few years, it has been difficult to achieve high attendance at independent STEMworks AFTERSchool engagements, however, the school events (like open houses and Ke Ali’i Night) were always well attended. Thus, partnership with school events has been the main focus of in-

person parent engagement. Parent surveys were difficult to collect, several copies went to families with both paper and digital option, but did not always return.

Exhibit 17: Performance on KPI Objective 2 – Hours per Week

Objective 2.4: Centers will offer services for 12 hours or more per week, and provide services when school is not in session, such as during the summer and holidays.		
Center	Number of hours per week services offered during the school year	Number of hours per week services offered during summer and holidays
Maui Waena Intermediate	12 (with three overlapping classes)	30 (5 weeks)
Lahaina Intermediate	8 (with 2 overlapping classes)	N/A (attended at Lokelani)
Lokelani Intermediate	12 (with 3-5 overlapping classes)	35 (two weeks)
Lanai High and Elementary	8	16 (two days)
Pukalani Elementary	7.5 (with 6-8 overlapping classes)	20 (6 weeks)

[Key Performance Indicators (KPIs) – Objective 3

Objective 3 - 21st Century Community Learning Centers will serve children and community members with the greatest need for expanded learning opportunities. (See description of communities in [Section 3.A](#) above.)]

4.B.4 Key Performance Indicators (KPIs) – Objective 4

Objective 4: Regular participants in 21st Century Community Learning Centers will demonstrate academic improvement based on formative and summative assessments given throughout the school year.

Note: All reporting in this section is impacted by the fact that functional data from iResults was not yet available as of the writing of this report. Program administration instructed all sites to collect and provide data from teachers regarding grades as a back-up to and cross-validation for iResults. Four out of five sites complied with this, and this data is used for this section. MWIS did not follow through with this directive and planned to rely on iResults for its reporting.

Exhibit 18: Performance on KPI Objective 4 – Academic Improvement in Reading/Language Arts

Objective 4.1: Participants in 21 st Century Community Learning Centers will demonstrate academic improvement in reading/language arts.				
Center	Percentage of regular program participants with IMPROVEMENT in reading/language arts from fall to spring	Primary Source of Data on Improvement:		
		Grades/ Course marks?	Assessment/ Test Scores?	Teacher Surveys
Maui Waena Intermediate	___% iResults pending	✓	☐	☐
Lahaina Intermediate	88%	✓	☐	☐
Lokelani Intermediate	75%	✓	☐	☐
Lanai High and Elementary	100%	✓	☐	☐
Pukalani Elementary	99%	✓	☐	✓

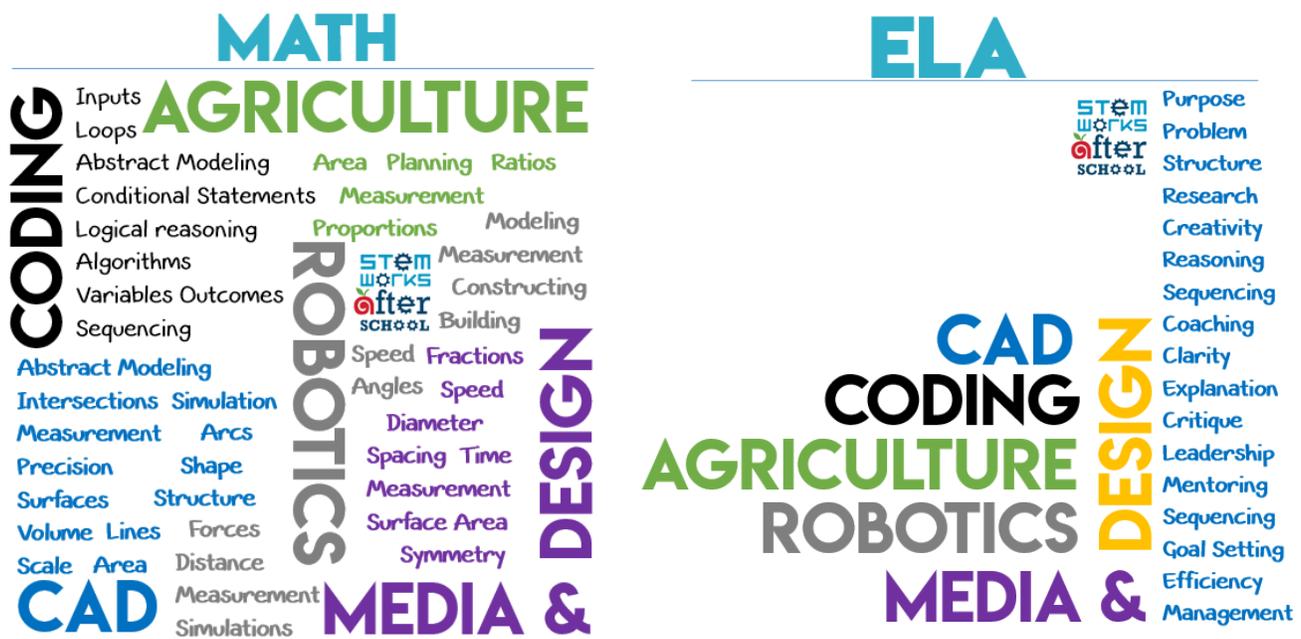
Exhibit 19: Performance on KPI Objective 4 – Academic Improvement in Math

Objective 4.2: Participants in 21 st Century Community Learning Centers will demonstrate academic improvement in math.				
Center	Percentage of regular program participants with IMPROVEMENT in math from fall to spring	Source of Data on Improvement:		
		Grades/ Coursemarks?	Assessment/ Test Scores?	Teacher Surveys
Maui Waena Intermediate	__% iResults pending	✓	☐	☐
Lahaina Intermediate	75%	✓	☐	☐
Lokelani Intermediate	65%	✓	☐	☐
Lanai High and Elementary	100%	✓	☐	☐
Pukalani Elementary	99%	✓	☐	✓

KPI Objective 4 Discussion: *Please describe particular successes or challenges related to KPI Objective 4.*

Success & Challenges:

Areas of success include cross-curricular alignment of ELA and math concepts into STEM projects. The infographics designed by STEMworks (below) highlight the ways in which ELA and math concepts were integrated into STEM classes in CAD, Coding, Robotics, Agriculture, Media and Design. This information was also shared at the April 15, 2019 Out of School Time showcase with other grants. The challenge was that ELA and math were hard to always implement at the same time into all STEM areas, often one or the other was a focus, not both.



Other areas of success included in-school behaviors and grade reporting. Students in-school Math/ELA teachers were asked to report on grades (Math, Science, ELA) and/or classroom behaviors. The challenge is obtaining this information from teachers due to the time that documentation and surveys take. Evaluation also now looks at data from iResults. (See section 4.B.5 Achievement of Program-Specific Objectives Discussion for specific information).

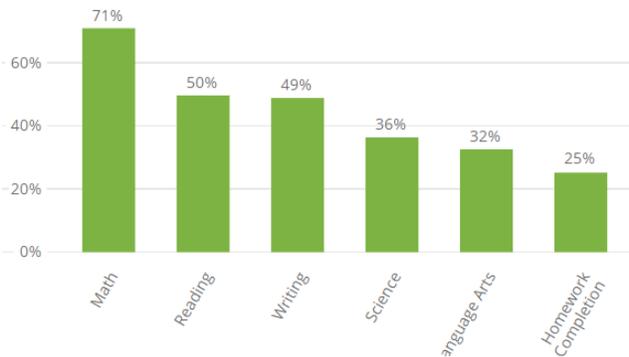
Additionally, in the final quarter, students were surveyed and asked to identify areas that they felt they improved (students attending 1 or more days were surveyed). Student confidence in their improvements in Math, writing and ELA aligned with focused improvements for the grant, as well as areas parents had identified that students needed support in.

Overall (at right), a quarter of students felt that they have improved in homework completion. 71% of students identified that they improved in math, 50% felt they improved in reading and 49% in writing.

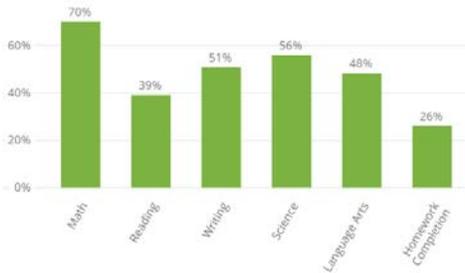
There continues to be a challenge of connecting student's confidence in their improvement of ELA skills (writing and reading) with students' confidence in improvement in the ELA subject. This disconnect can be seen across sites in the graphs below, which depict students' feelings of improvement in subject areas by site.

Out of all the sites, Lanai students seem the least confident in their ability in math, as only 33% of students felt they improved, even though their teachers felt that 82-100% of program participants had improved in math. Building student confidence in their own math ability continues to be a challenge at this site.

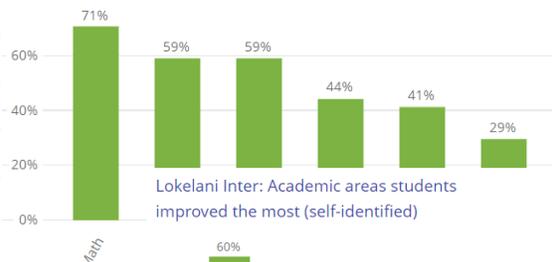
ALL 5 Sites: Academic areas students improved the most (self-identified)



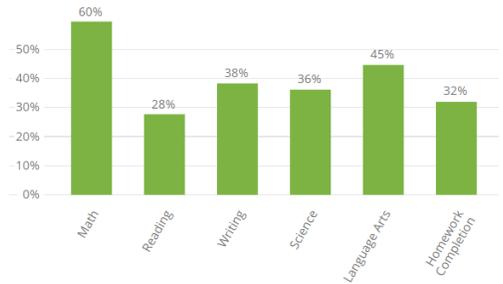
Maui Waena Inter: Academic areas students improved the most (self-identified)



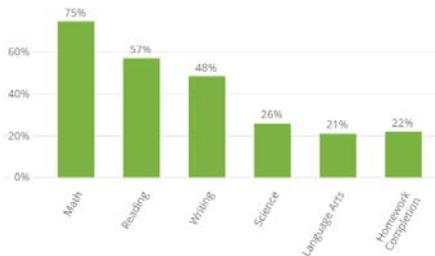
Lahaina Inter: Academic areas students improved the most (self-identified)



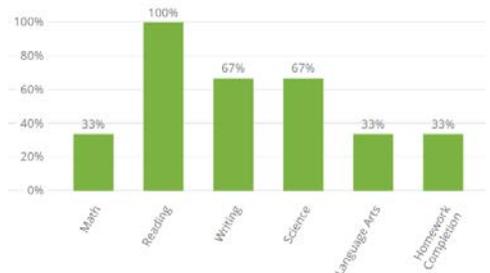
Lokelani Inter: Academic areas students improved the most (self-identified)



Pukalani Elem: Academic areas students improved the most (self-identified)

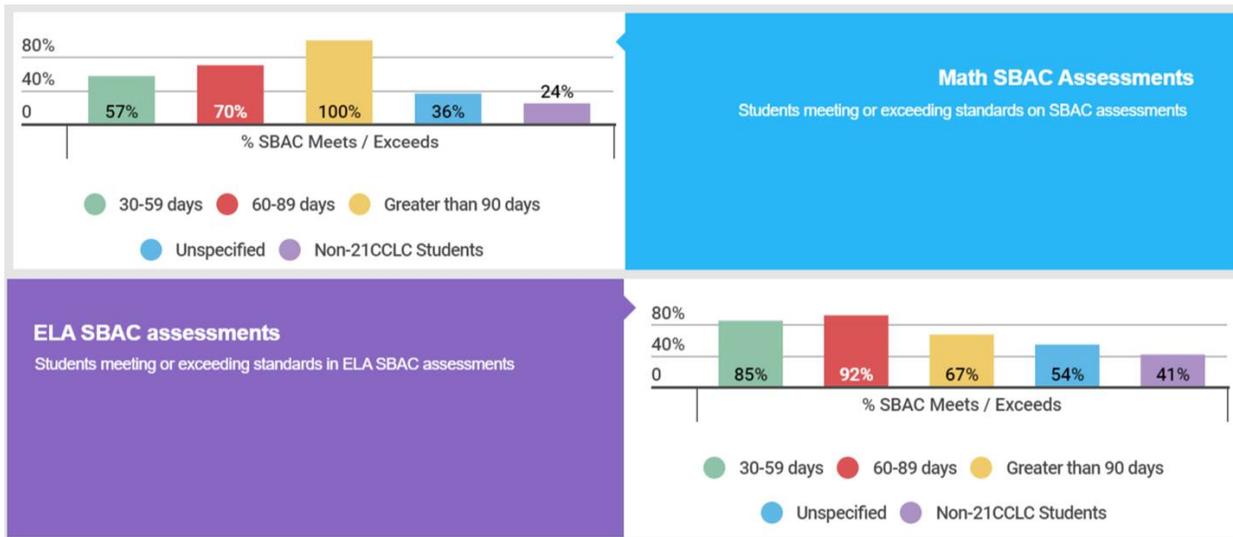


Lanai High & Elem: Academic areas students improved the most (self-identified)



Data on standardized testing the HI DOE iResults (Spring 2018) shows program participants in MEDB's programs

performing non-participants, which is promising news since students who attend at least 30 days mark for both Math and ELA appear to have a 2x greater ability to pass these standardized tests. Functional data from iResults was not available as of the writing of this report.



4.B.5 Achievement of Program-Specific Objectives

Please describe achievement of the program-specific objectives described earlier in [Section 3.B.2](#).

- Objective** - State the specific measurable objective
- Measure** – state the type of data collected to measure this objective
- Results** - Summarize evaluation findings related to this objective
- Met/Not met** – for each objective specify one of the following:
 - Met
 - No progress
 - Not met
 - Unable to measure
 - Progress

Copy objectives and measures from the table in section [3.B.2](#) into Exhibit 19 below. Make sure to select the whole text box by clicking on the three vertical dots to the upper left of the box. Complete the exhibit with results and the status toward meeting the objective. Sample in grey.

Exhibit 20: Progress on Program-Specific Objectives

Objective	Measure	Results	Met/Not Met
A. 70% of students with room to improve will improve ELA, Math, and Science grades.	Teacher Grades	Students attendance vs. improvement in ELA, Math, Science improvement: 30-59 days- 81%, 81%, 82%; 60-89 days- 86%, 83%, 90%; 90+ days- 83%, 100%, 100%	Met
B. 70% of students will self-report improvement in ELA, Math, and Science	Student surveys	77% of students identified that they improved in math and 42% believed they improved in science. 42% believed they improved in Language Arts (reading and writing). 59% of students assessed themselves as improved in reading and 49% as improved in writing.	Progress
C. 80% of students express interest in STEM careers	Student surveys	91% of students identified a STEM career or interest.	Met
D. 80% of students self-report use and mastery of elements of engineering design process (EDP).	Student surveys	Out of 10 EDP elements, 8 had students reporting 81-86% use.	Met

E. 90% of students express confidence in their abilities to complete tasks and achieve goals	Student surveys, Teacher Survey	70-86% of students report success in these areas	Progress
F. 90% of students recognize and act on their responsibility for building collaborative teams.	Student surveys	80% of students report success in this area	Progress
G. 70% of program families participate in at least one program activity.	Program attendance logs	84% of parents attended hands-on STEM engagements with student presentations.84% of parents attended hands-on STEM engagements with student presentations.	Met
H. 70% of families engage with student progress.	Parent Surveys, Student surveys	85% of students talk to their families about STEM projects/activities.85% of students talk to their families about STEM projects/activities.	Met

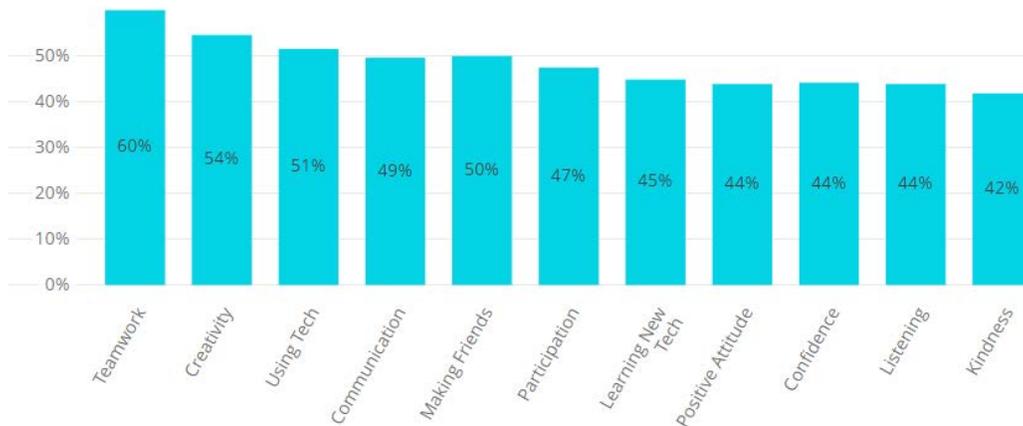
Achievement of Program-Specific Objectives Discussion

These objectives are consistent with those of last year.

Objective A. 70% of students with room to improve will improve ELA, Math, and Science grades.

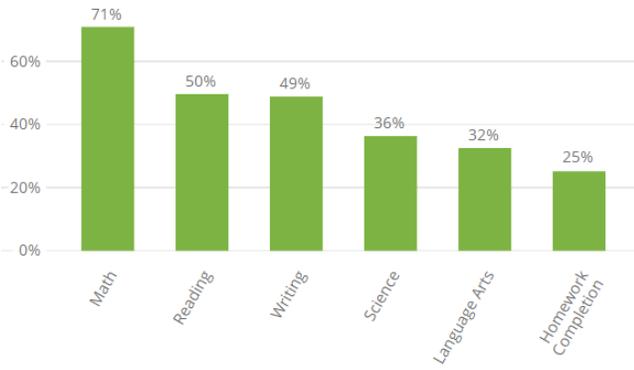
In addition to data on grades provided by teachers, the students were surveyed to identify areas of “improvement in self” in their “soft” skills, renamed “employability’ or “career and professional” skills by industry. Across sites, students assessed themselves as making the highest improvements in teamwork, creativity, using tech, and communication skills. About a third of students also identified as having increased empathy for others as well as improved mentorship. Overall 100% of students self-identified a variety of personal ‘self-improvements’.

Employability (Career & Professional) Skills Students Improved the Most (self-identified)



Objective B: 70% of students will self-report improvement in ELA, Math, and Science

ALL 5 Sites: Academic areas students improved the most (self-identified)



Overall, 71% of students self-identified improvement in math, 50% of student identified improvements in reading and 49% of students feel they improved in writing. Based on pre-surveys from parents and students, the program focused the most in these areas. Interestingly, student’s feelings on self-improvement in ELA was scored at just 32% (which may mean that students do not understand what is meant by “language arts”). For all attending students (≥1 attending day) the chart below outlines comparisons between student ‘confidence’ in their academic improvement as compared to teacher reported grade improvements by site. Functional

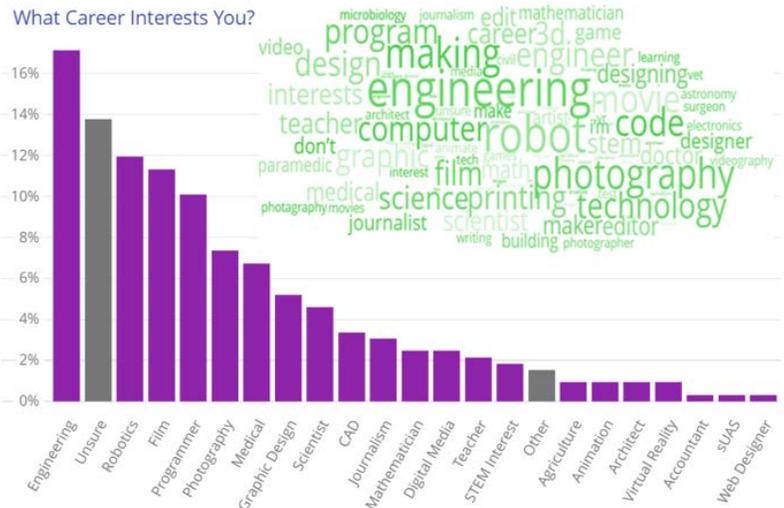
iResults data was not available as of the writing of this report, and MWIS did not provide back-up data collected from teachers.

Includes all attending students 1+ days	Math			Science			ELA			Writing	Reading
	Student	Teacher	iResult	Student	Teacher	iResult	Student	Teacher	iResult	Student	Student
Pukalani Elem.	75%	99%	unavail %	26%	100%	unavail %	21%	99%	unavail %	48%	57%
Maui Waena	70%	unavail	unavail %	56%	unavail	unavail %	48%	unavail	unavail %	51%	39%
Lokelani Inter.	60%	62%	unavail %	36%	73%	unavail %	45%	72%	unavail %	38%	28%
Lahaina Inter.	71%	81%	unavail %	44%	77%	unavail %	41%	81%	unavail %	59%	59%
Lanai High & Elem.	33%	88%	unavail %	67%	88%	unavail %	33%	82%	unavail %	67%	100%

Objective C: 80% of students’ express interest in STEM careers

84% of participating students identified a STEM career of interest and 86% of student identified any career of interest.

Students applied the engineering design process while exploring technology application in projects. Students report learning about the following areas of STEM (note: Pukalani Elem parents supported helping their young learners take the post survey for grades K-3). As in prior years, there appears to be a correlation between the variety and access to course offerings at a site and the variety/choices made by students for career pathway interests. This

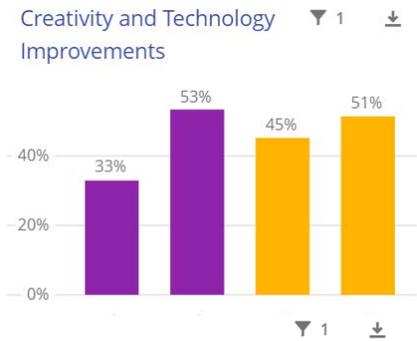


continues to suggest there is value in providing students with a wide variety of STEM opportunities that will help grow their future interest in a wide variety of STEM fields

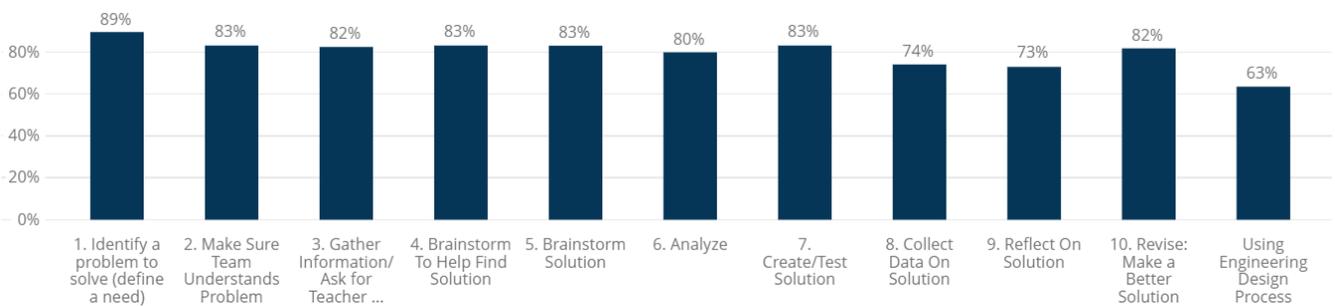
Objective D: 80% of students’ self-report use and mastery of elements of engineering design process

Overall 81.2% (between 74% to 89%) of program students report using elements of the engineering design process, especially in making a solution better and brainstorming to find solutions. Fewer students (73%-77%) report collecting data and reflecting on solutions. Interestingly, students show a disconnect between “Using the Engineering process” and using its elements/parts.

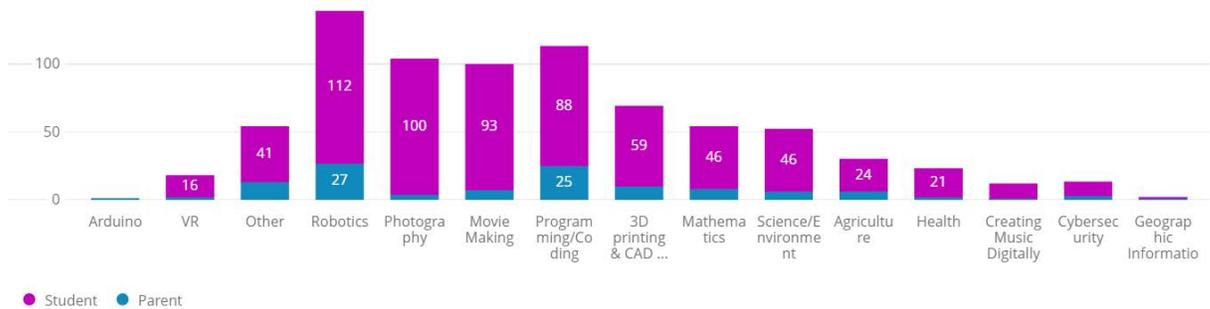
Additionally, to be able to solve problems and apply the engineering design process, students need to be able to use their creativity. Often, final touches on a project include creative ‘artistic’ elements. Adding to this, students need to be able to use/apply technology and learn new technology for their solutions. Therefore, engineering design elements also include aspects of the arts/creativity as well as technology use and learning. About a third to over half of students felt that they had improved their skills in these areas.



Percent of Students Practicing EDP

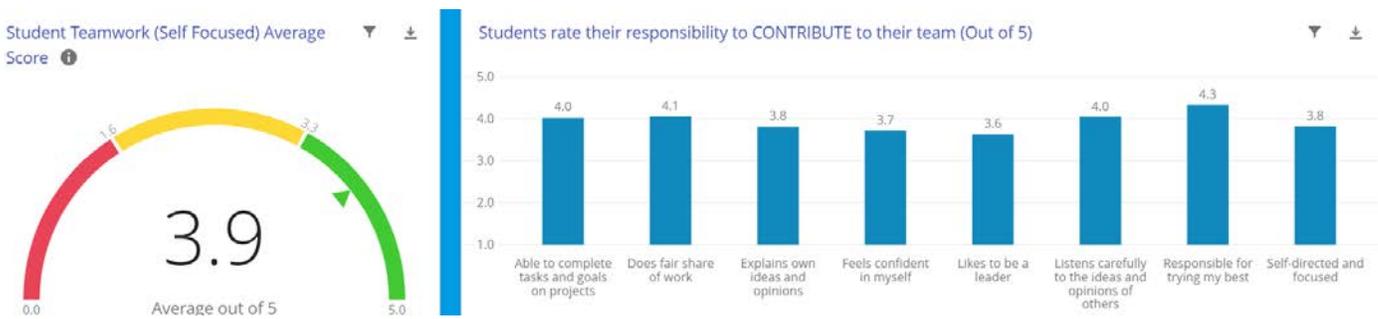


STEMworks Students Learned About....

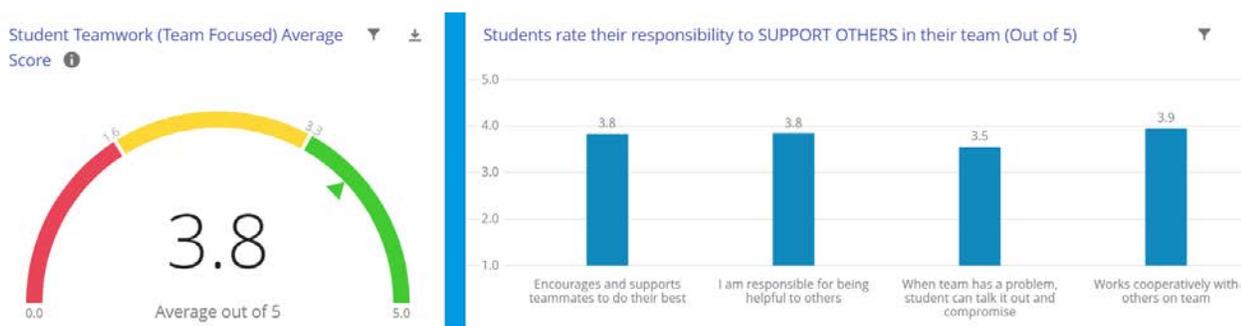


Objective E: 90% of students express confidence in their abilities to complete tasks and achieve goals; work well and collaborate with others on a team

Data is collected within a series of survey questions about where students rate (0-5) their ability to be successful and responsible team members, with a score of 5 meaning “100% of the time” and 0 meaning “0% of time time”. On average, students had an overall rating of 78% (see below). Specifically, on average 76% of students say that they improved on being “self-directed and focused” and 80% say they are able to “complete tasks and goals on projects.”

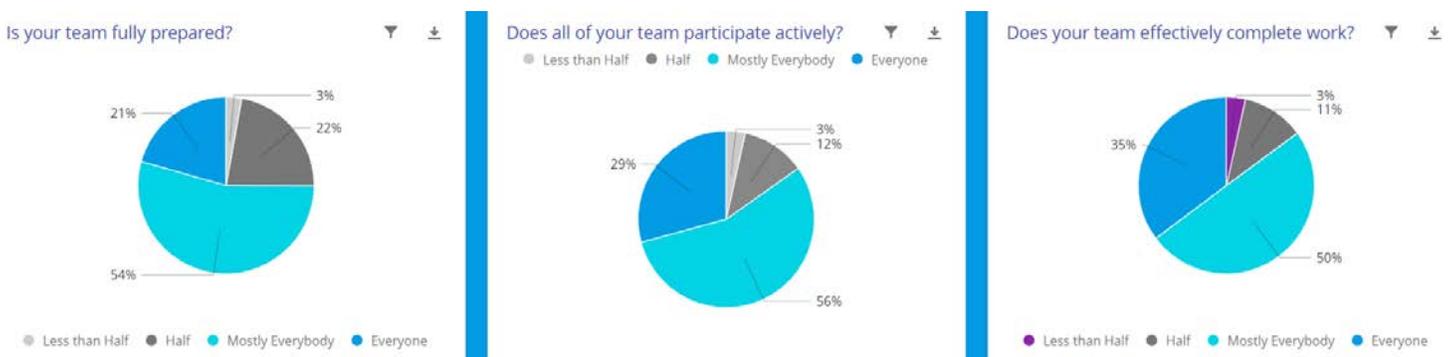


The ‘Me’ and ‘We’ of collaborative Teams: Program examines the interplay of students working through self-responsibility to contribute to their teammates, as well as their teammates responsibility back to them. (Below) A series of questions were asked to determine student’s ability to ‘recognize and act’ on their responsibility to a team. All students recognized abilities to act on their responsibility to their team, but with varying levels of dependability on a rating scale 0-5, with a score of 5 meaning “100% of the time” and 0 meaning “0% of time”. Overall, students rated that they exhibited these behaviors about 76% of the time (equal to an average score of 3.8 out of 5).



Effective Work completion, Team Participation & Preparation

Part of working as a team is effective work completion, preparedness and participation. Students rate their team participation and preparation in the following graph, averaging the three areas, students report that about 82% of the time (most and all) of their teammates show readiness to be fully prepared, participate actively and complete work.



Objective F: 70% of program families participate in at least one program activity.

The program has a multi-pronged approach to include families, especially since many family’s work and not all families may be able to attend engagements. Initially, upon program entry in the fall semester, parents are invited

(and reminded) to complete either a paper or digital survey in order to provide input into the program and their child which will be used to improve program. Then parents are invited to STEM family engagements throughout the year, where students present, share and teach parents (and siblings) how to do/make/build something or share their STEM project work. Additionally, students are encouraged to share with their families about their projects and work in the program, to engage in conversation about STEM at home. Note, in the table below, sign in sheets were used for families, in many cases other adults and families attended program (such as interested teachers, students from younger feeder schools, families not attending the program afterschool). However, this table reflects only community attendees at family engagement with students attending the program. Additionally, about 1/3 of families attended multiple engagements. Also see **Parent/Family Services Discussion** above.

Family STEM Engagements 18-19:		Program Parent Survey 18-19		Students Talk to Parents about Projects 18-19	
Overall, 91% of parents attended hands-on STEM engagements with student presentations.		Overall, 54% of parents completing program entry survey during Fall 2018 used to inform/improve program.		Overall, 88% of students talk to their families about STEM projects/activities.	
Maui Waena	93% of parents and 83% of families	Maui Waena	61%	Maui Waena	88%
Lahaina Inter	43% of parents and families	Lahaina Inter	98%	Lahaina Inter	76%
Lokelani Inter	57% of parents, 55% of families	Lokelani Inter	22%	Lokelani Inter	81%
LHES	50% of parents and families	LHES	0%	LHES	67%
Pukalani Elem	128% of parents and 100% of families	Pukalani Elem	63%	Pukalani Elem	93%

Further reflections on site-specific successes and challenges below:

Maui Waena (MWIS):

- MWIS STEM Content/Delivery/Learning:** The challenge here was in trying to teach a given topic to the whole group. This was a challenge because of a larger group size and inconsistent attendance (especially due to band and sports). The benefit from the large group size and inconsistent attendance was that students needed to develop into mentors. Ones who were present when a concept, technique or project was introduced would take it upon themselves to teach the ones who were not there. This solidified learning and built communication skills and leadership skills. Students Actively engaged in the design process—empathize, define, ideate, prototype, test, iterate—to produce both student-initiated projects and products to specification for contests and outside clients. In CAD and computer science, students constructed products to meet "real world" needs or address interests, students developed measurement and math skills, practiced divergent and convergent thinking, collaborated and communicated, and persevered.
- MWIS Incorporating ELA:** Success in implementing ELA into the program was seamless. It fit extremely well with digital media: script writing, editing and revising is the writing process in a practical and applicable form that is highly motivating for students. In computer science and CAD, students needed to do research which honed ELA skills. In the CAD Superhero competition challenge, students enlisted the assistance of other students to create a narrative backstory for their hero. Students persevered through difficulty and managed their time amazingly well for intermediate students
- MWIS Incorporating Math:** A primary challenge was helping students understand how math represents tangible qualities, like distance, amplitude, time, volume, etc. Students in CAD were required to switch between imperial and metric units. Students working with electronics had to work with various units of measure for different electronic qualities (resistance, capacitance, reactance, gain, DC/AC/RMS voltage, current, etc.). These topics could be difficult to understand, but application helped make the math real. In CAD, creating products to meet "real world" needs or address interests, students developed measurement and math skills, practiced divergent and convergent thinking, collaborated and communicated, and persevered.

- **MWIS Overall highlights:** Maui Waena program was very successful on every front. They won many awards in video production, did well in robotics, making it to states for both VEX and VEX iq (even qualifying for nationals in VEX iq), and also garnering awards for graphics and CAD.
 - Media: STN (1st place feature story–Driven to serve, 3rd place PSA–Seatbelts change lives, 3rd Place Music Video); Olelo (1st place PSA–The Last Straw, 808 Digital Storytellers, 1st place animation–Seatbelts change lives, 1st place Feature Story–Aquaponics Hawaiian Style); STN National Convention (2nd place Crazy 8s broadcast–Native American Culture, 2nd place convention promo, 2nd place PSA–Going Green, Honorable mention feature story–Purple Store, Honorable mention crazy 8s short film–Puddle Jumper) Hiki No: (1st place Winter Challenge–Driven to serve, 3rd Place Fall Challenge–Local Farmer)
 - Robotics: VEX IQ: (Maui League Champion, Valley Isle Tournament Champion, Teamwork Award, Robot Skills Award, Design Award)
 - Other Awards: Science Fair: 1st place Maui County junior overall, 1st place State Fair—junior physics and astronomy; Qualified for Broadcom Masters; Special recognition from Office of Naval Research; A & B Merit award; NASA Earth System Science Award; 1st place STATE Science fair - Jr. Physics & Astronomy
 - STEM Conference: 1st place Design Challenge for “CAD Kid” Superhero, 1st place Design Challenge for “Octoman” STEM Mascot, 1st place Hackathon “Voyaging Song”
- **MWIS Impact on school community (student, teacher and parents) over the grant period:** The impact of the program on the students and school was great. It gives both the members of the program and the entire school pride in what the students accomplish. It also promotes the school at large and is actually a draw to Maui Waena, with many students applying for GE’s based on the STEM program! The reputation of the program is so good that the summer 2019 STEMworks program filled almost immediately and has a wait list. The program is also growing traction and building experience in STEM with other in-school teachers as more teachers have become involved in the program as volunteers and chaperones.

Lahaina Inter (LIS):

- **LIS STEM Content/Delivery/Learning:** Each week, the STEM focus area was announced on the school’s morning broadcast and through an enews blast so both students and parents were aware of the topic. Teachers developed or facilitated project opportunities for students to create products as they learned a new STEM skill or software. Students had opportunities to create designs that they could keep or enter into various competitions. In this way, the program focused on a rotation of STEM skills and projects across the year. The challenge was depending on the focus, the instructors had to brush up on skills or make sure the person who knew the skill was the main facilitators on that upcoming Monday. This challenge was easy to fix as instructors just traded days with each other. The weekly focus was successful, students had opportunities to learn and work with so many different technologies and software. Because of the weekly focus some students tried things they wouldn’t have otherwise and found out that they liked it and wanted to continue learning more about it.
- **LIS Incorporating ELA:** A challenge was that some students struggled to articulate why they created their designs, they need more practice explaining and presenting, which was supported by parent nights within their STEM booth. Another success in developing this area was that students had the opportunity to support some of their projects with written descriptions and reasoning behind why they created something and how it could have an impact on their community, especially when it came time for the STEM Conference challenges.
- **LIS Incorporating Math:** There were a few times when students struggled specifically with measurement concepts with 3D printing and with programming Spheros. In the future facilitators plan to incorporate these types of practice opportunities more explicitly during instruction. A huge success was having the Math Counts program, which allowed for many students to practice math problem solving skills while developing a math learning community among students.
- **LIS Overall highlights:** Throughout the grant timeframe the program has struggled with finding a balance of developing student independence and interests, while also being rigorous (students use tool to play games more than learn). This year the program found a good balance of exploration and instructor guided activities. Having a STEM focus that changed every few weeks was easier on the facilitators, encouraged facilitators to learn new areas of STEM along with the students, which helps to build program capacity for the future as

well. Having more guest speakers this year was a positive experience for students, parents and teachers. At least one parent remarked about her son's excitement after hearing from a metallurgist. Students enjoyed the interactive experiences with the speakers and teachers were able to see how some of the weekly focuses were used in careers for people right here in our own community.

- **LIS Impact on school community (student, teacher and parents) over the grant period:** Students were exposed to new things. Some students who would not have attended on their own did so when invited by friends or after receiving a personal invite by one of the teachers in the program (in this way it was also helpful that the program had so many of the in-school day teachers). These students found out that they had access to different technologies that they didn't even know existed and many students expressed a new interest in pursuing a STEM career.

Lanai High and Elem (LHES):

- **LHES STEM Content/Deliver/Learning:** Students who attend are very engaged, and enrollment was marginally increased with the lure of competitions and presentations for the Hawaii STEM Conference. The site coordinator realized that they need to incorporate more competitions locally and nationally throughout the school year, and this would keep students involved more.
- **LHES Incorporating ELA and Math:** Students work on academic homework during the class, sometimes spending all their time in this area as needed. The newly implemented common core standards are especially challenging for students. For math engagement, online games and programs were the most successful. For ELA, using Google Docs for write-ups before and after projects helped students to practice and keep them accountable for their work.
- **LHES Overall highlights/Impact on school community (student, teacher and parents) over the grant period:** The students that did attend regularly definitely got a lot of exposure to STEM, and expanded their knowledge. Students were able to mentor from older to younger which was great. Students successfully completed the online e-school computer science course with code.org, which was one of the school's program goals. Due to the development of skills in the summer 2019 Movie Making camps, students won an Olelo video contest about the dangers of vaping, producing a PSA that was student led and directed.

Pukalani Elem (PES):

- **PES STEM Content/Delivery/Learning:** Challenge: The students seemed to be completely engaged in the STEM content that was presented, but instructors continually tried to look for ways to deepen the learning for the students. Instructors wondered if there were more available content that they could and should be covering. Success: STEMworks provided a Teacher PD in September which 5 instructors attended. This training developed instructors' background knowledge of available technologies and lesson plans. Instructors also attended the STEMworks STEM conference where they were exposed to a variety of STEM materials and opportunities. They networked with other STEM teachers from around the state and took away ideas to incorporate.
- **PES Incorporating ELA:** Challenge: Some of the students needed individualized help with their writing and the larger class sizes sometimes made it difficult to attend to those students of greater needs. Success: The K/1 students wrote in their journals once a week. Students reflected on new learnings. They also wrote about any challenges that were encountered and steps they took to overcome them. Personal growth was also noted in the journals. Upon inspection of the students' writing over the course of the year, it was noted that their handwriting, grammar and spelling skills improved. Most of the students enjoyed the weekly writing activity. In robotics, students kept journals of learning and activities. In garden class, students wrote about once a week, which included writing questions for a guest speaker, thank you notes to guest speakers, usually exit ticket /reflection type writing prompts, developing their plan for their redesign of the garden, etc. The results were that students that struggled in the beginning of the quarter had a boost of confidence by the end. There was one particular student that previously hated writing in class but she would write even at home to bring in some ideas for the garden class, and it was exciting to see that change. Students learned that writing is a necessary life skill.
- **PES Incorporating Math:** Challenge - elementary students have not been exposed to the higher levels of math that are often required in STEM lessons. In robotics, in order to program turns, students have to have an understanding of angle degrees and be able to calculate ratios. Older students were taught to create formulas in programming. Children as young as 1st grade were tasked with learning some of these concepts. Success—

The 3D Printing Class took measurements and drew out scale models on paper to see how big the prints were in real life. Kids had to figure out missing sides and calculate lengths that weren't explicitly given by the program. Programmers in the advanced robotics team successfully finished in 4th place at the national competition.

● **PES Overall highlights:**

- Over 130+ students were given STEM Afterschool Certificate for participating in at least 30 hours over the year, with several students attending over 100+ hours.
- The competitive robotics team was able to compete in 3 tournaments on Maui, 1 state tournament, 1 national tournament in Iowa, and 1 international tournament in Japan. Numerous awards were earned this year including: Design, Skills, Excellence, STEM Research, 1st and 2nd Teamwork Challenge at all levels of competition. The 14 students practiced the engineering design process on a daily basis, consistently striving to excel and outperform themselves. When asked what they think they gained over the year, the coaches were happy to see that the soft skills were at the forefront: perseverance, friendship, grit, teamwork, helping others beyond your team, responsibility, respect for others, etc.
- Service learning opportunities grew. Several classes provided services to others this year. The graphic design students created posters, flyers, bumper stickers, and buttons for the school's programs. The school gave student-driven products to their families, and the students, using their skills to help their community, gained much pride.

● **PES Impact on school community (student, teacher and parents) over the grant period:** Pukalani School's Hawaii State Assessment scores in science have grown over the 3-year grant period 2016-2019. Students are being exposed to the STEM fields and careers. Students are talking to their parents and sharing their learning. This exposure is creating interest and curiosity to question and learn more beyond the hours within the school day.

School Year	HSA (Science)
2014-2015	49%
2015-2016	56%
2016-2017	76%
2017-2018	85%
2018-2019	82%

The first year that the STEMworks afterschool program was started, the goal was to give as many students as possible the opportunity to gain stem related skills. All grades K-5 were included and over 200 students were enrolled in 14 classes once a week. The next year, the goal was to have students attend more classes per week to strengthen the skills that they would learn. Enrollment became limited and students had to be turned away. However, with more class time, the instructors were able to do more with their students. The projects and outcomes were shared with parents through family nights, flyers, students, etc. Parents showed great appreciation for what their children were learning and word spread through social media, word of mouth, school Leadership Day events and even through the Maui News. According to the teachers and school community, it became the "talk of the town" that Pukalani School is a great place to be with a variety of opportunities for all students. One parent recently shared that if she had known about Pukalani School's STEM program when her son was younger, she would have transferred him from his other school a lot earlier. News articles of Pukalani's STEMworks program. <http://www.focusmauinui.com/pukalani-students-aspire-to-be-leaders/>.

Lokelani Inter:

- **Lokelani STEM Content/Delivery/Learning:** This year, the program focused on connecting projects to purpose to help increase the quality of work, and in its third year, the Lokelani program students have begun to enter many competitions and earn many awards, In agriculture, students practiced inquiry and problem-solving skills while completing projects: setting up germination, fertilizer, worm castings, and pest control experiments in the nursery. Students also collaborated well to train for the FFA (Future Farmers of America) competitions and set goals. Students also really had fun developing their website, with 8th graders sharing interest in continuing to develop computer skills into high school. Learning digital media and CAD skills, students worked on the T-shirt design competition, photography and CAD competitions for STEM conference. Students learned to use illustrator and tinkerCAD to create final products; they measured the object sketched on paper and implemented the idea digitally. Additionally, 3D printing / CAD students worked on and explored purposeful and meaningful designs and topics such as toy-making, sustainable products, 3D printed fabrics, 3D printed foods, tech gadgets, and creating manipulatives for their algebra class. For the STEM Conference, the students created superheroes and reflected on what it means to have

super powers and how to ethically use such powers to help others. Through the progress, students using engineering design and redesigned many times, were eager to present their best results and collaborated. Robotics students collaborated, programmed and designed all year long through classes and competitions, making it to both Nationals and Worlds. In agriculture, students placed first place in the Vegetable Judging Career Development Event competition at the Hawaii State FFA competition, placed 3rd in the FFA Creed and Job Interview event and one student is going to Washington D.C. to attend the National FFA State Convention this July!

- **Lokelani Incorporating ELA:** The program supported students in application of ELA through summaries, skits, websites that showcased their work. Instructors reminded students to use more accurate vocabulary when they did share outs and presentations with their peers. The program supported students in proof-reading and editing student work/projects (speeches, mock cover letters/applications, educational displays, flyer creation, and building the Lokelani FFA website). Each day the students worked on homework at the beginning of class, which often consisted of ELA and Math.
- **Lokelani Incorporating Math:** In CAD and Agriculture, students applied math through measuring distances to lay irrigation or design in 3D, measuring volume and area, ratios and angles, and calculating mock budgets. In Math Counts students learned mathematical skills directly, solving and applying math skills to problems. In robotics students applied measurement and programming with mathematical concepts during robotics build and design. Overall, students had real world experience in applying math skills.
- **Lokelani Overall highlights:** One of the site goals fulfilled in the program this year was to connect students with more professionals so they could see the link between their classes and future careers. While participating at the Maui Chapter Math Counts competition, students directly met with its director who talked about real world applications for math. Digital media students learned skills from a local photographer, the CAD and 3D printing class used NEPRIS chats to see how 3D and CAD professionals designed theme park rides at popular destinations, as well as how they use design to create characters for the cinema; the agriculture instructor often volunteered and extended the program beyond the grant hours and students had opportunities to work directly with an irrigation specialist to learn how to set up irrigation, visited Kihana nursery to pick out parts needed for project at Lokelani school: a new manifold, running of existing timer to irrigate the Native Hillside, Canoe plant Garden and Stone terrace garden areas; at the Upcountry Farmers Market, students interacted with the greater Maui community and many small business owners while practicing entrepreneur skills, students did a hike at the Palau'ea/Ke'auhou native plant preserve with the Chairperson of the Maui Sierra Club to observe and learn about rare and endangered Hawaiian Lowland dry forest species and pre-contact cultural sites; while participating at the Hawaii State FFA State Convention in Honolulu, students directly met with senators and legislators at the state capital building, they also observed legislative sessions in the council chamber hall.
- **Lokelani Impact on school community (student, teacher and parents) over the grant period:** The instructors shared that this AFTERSchool program is a vital extension of the school day. It allowed students to explore and learn about the greater community and be involved in something that will benefit their future. One instructor who is also a community partner, commented, "We are a tiny school, on a tiny island, and students have gotten this exposure to the greater world around them; we are not just teaching them, we are growing their foundations for an amazing future." The program instructors saw students take on ownership of projects and several students developed leadership roles during the program. Graduating 8th graders are excited to continue digital media and computer science in high school, and even reached out to Maui High to find an advisor to begin an FAA club. Thus, students are taking initiative to follow up on their interests or create opportunities for themselves. Students gained confidence and learned more time management. Sometimes there were weekend community events at the school; many program students and families overwhelmingly participated as compared to the whole school population, demonstrating ownership in their school community.

4.C. ADDITIONAL DATA

4.C.1 Success Stories

Maui Waena Success Stories:

- Student A was quiet and uninvolved at the beginning of the year. Site teachers spent much time to encourage this student to try the program at the end of the previous year and it took the teacher reaching out for over a month at the beginning of the year to get this student through the door. Over the course of this year, she became an integral part of the digital media group and was a part of several competitions. Her self-confidence and abilities have grown to where she now mentors and directs her team. She also gained tremendous respect of the whole program as she has honed her camera and graphics skills.
- The Maui Waena CAD students supported each other over the past year in diving into the application of Fusion 360 and won the CAD Superhero challenge. They began immediately after the challenge was announced, checking the requirements, defining the task, and ideating (initially on paper). They exhibited high level of perseverance and independence; worked largely on their own, seeking help from adults only when they were absolutely stuck and had exhausted all other avenues for solving their challenges. They took it upon themselves to attempt repair of the Boxzy 3D printer, and learned a great deal along the way. They enlisted the assistance of other students to create a narrative backstory for their hero, and when confronted with difficulties they could not overcome, in many cases redirected their efforts to achieve their goals in another way. They persevered through difficulty and managed their time amazingly well for intermediate students. The outcome of their effort was a first place win at the 2019 Hawai'i STEM Conference.

Maui Waena Intermediate Strengths:

- ***Enabling student leaders.*** Program returnees from previous years or semesters mentored their newer student peers. It has been an effective way to build capacity and give students ownership of their learning. Community sharing and teaching through the STEM Exploration Days were another way that the students became confident with what they know, practiced presentation and communication skills, and were able to share with others.
- ***Creating an environment of trust and respect.*** The program is very diverse and inclusive, students and teachers help to make everyone feel like they belong, and the returnees act as not only learning mentors to the newer students, but also as "big sisters/brothers." To build this environment over time, much whole group time is spent on setting behavioral expectations, how to work collaboratively and sharing how students are feeling, all of which helps create an inclusive environment which promotes sharing and trust.
- ***Students apply professional tools to continually improve the quality of their work.*** By integrating the teaching of After Effects and more advanced camera work, students have been able to refine their work using industry tools, apply new skills and improve quality in digital media. Program has challenged student programmers to push themselves and go beyond the drop and drag programming that is common with VEX IQ which has allowed for greater understanding and flexibility in programming and movement of the bots.

Lokelani Inter. Success Stories:

- During mathematics, one student put continuous effort into learning more and improving and ended up ranking within the top 5 during competition out of 56 students for the individual scores and within the top 10 for groups. All the students worked consistently and strived their best.
- Nearly all students who participated in the FFA/Agriculture afterschool STEM program this year said they hope FFA is available next year for them again. The 8th grade students are leaving with a goal of establishing an FFA Chapter at the high school where they are going next (Maui High). One student already made contact with a potential FFA advisor at the high school about organizing and setting up an FFA chapter.

Lokelani Intermediate Strengths:

- ***Students develop STEM skills and access the tools to create good quality work.*** With the integrating of teaching, researching and exploration of the tools, new students have learned how to operate the tools independently (3D printer, camera etc..) to create better quality work. Students are very confident in presenting what they learned from the club to community at parent engagement STEM showcase night. In addition, student robotics programmers have shown intrinsic motivation and challenged themselves through practicing increasing depth of applicable coding skills with their bots. The team won 1st place at the Valley Isle VEX IQ tournament.

- ***Creating an environment of trust and respect.*** Teachers set clear expectations and routines for students to support an environment of trust, respect and peer collaboration. Students have gotten to know each other better to develop positive relationships. Despite the range of student ages, interests and knowledge levels, students learned how to cooperate and work in collaboration; returning students shared their knowledge as they mentored newer students. Even after an intense school day, students were excited to see each other and learn together from the facilitators.
- ***Develop communication skills and the potential of student leadership.*** For each of the STEM areas (clubs) offered during the program, facilitators empowered the students through training and coaching students into leadership roles so that students took ownership over helping their peers. Students learned that everyone, both new and returning students, has unique and important skills and knowledge to share. The program encourages students to step into leadership roles to mentor their peers, while developing their communication skills. For example, returning robotics students support new students in technical skills and timelines; returning agriculture students teach others about plant health, propagation, and cutting; older math club students communicate their problem solving process to younger students.

Lahaina Inter. Success Stories:

- One student had never used Final Cut Pro software before this Spring semester. After putting together some PSA announcements that had all of the pieces pre-made for him by other students during last semester, this student came back to the program in spring semester with renewed creativity and worked on completely self-created original video. He included background music, animation, and created smooth transitions.
- Another student found lots of success with VEX IQ Robotics in preparation for a tournament and in actual competition. He was able to problem-solve with perseverance to build and reprogram his robot until it could do what he wanted it to do, and he collaborated with other teams to learn new skills and strategies that helped his team score more points during the competition. He expressed great enthusiasm for continuing.
- Another student discovered his interest, talent and enthusiasm for a broad range of activities: photoshop, video, and stop motion. His confidence increased and timidity decreased. He was invited to the STEM Conference and had to practice for the Spotlight event. His experience at the conference and at the Spotlight event helped him to open up even more.
- Another student gained more confidence throughout his STEMworks AFTERSchool experience because of being able to try new things. Through the experience of working with his peers, he also was able to work on some of his social-emotional learning skills. He learned about himself and how he interacts with others when working in a team setting and how he can use that experience to improve his social skills.

Lahaina Intermediate Strengths:

- ***Growing mentorship:*** A core of about 20 students are regular attendees to the program and students attending from previous years, especially in digital media and CAD/3-D printing have developed their technical skills, confidence and communication skills; they have become mentors to other students in their area of specialty. Students go to them for help and they share their knowledge with other students.
- ***Creating an environment of trust and respect/ Safe place for students with Challenges:*** The program facilitators have created a very inclusive environment where students have a safe place to be grow into their interests and be themselves; the environment is very inclusive which promotes sharing and trust, which supports students to open up and be willing to take more chances, share with each other and not only listen to one another but reach out to ask for other's help and ideas.
- ***Growth of new skills through structured exposure to new areas of STEM:*** The program moved from less structure (of individualized student pursuits) to a more defined schedule that supported students in finding new areas of interest. Through the increased structure, in addition to returning students becoming leaders/mentors, new and returning students more quickly learned and applied technical skills (digital media, CAD, coding, etc.) and career skills (communication, time managements, planning, collaboration, etc.) to create better quality work. Additionally, students showed more intrinsic motivation and ownership of their work in projects, diving deeper into the details of creating quality work.

Pukalani Elementary Success Stories:

- A student in the general education classroom has for years had a disconnect with the other students in her class. She lacked social skills and academic skills in reading, writing and math. These combined struggles

made her lack confidence even in a classroom with a very kind, innovative and inclusive teacher. This student signed up for the STEMworks Garden class for the second semester. This garden class was made up of second graders who worked afterschool to plant, harvest and open a farmer's market for the school community utilizing their second grade garden. Our newly enrolled student was a 3rd grader and the year before she had worked with her class on a Project Based Learning project to revitalize the 2nd grade garden. This student instantly became the expert of the group and took on a leadership role. Thanks to the partnership of the STEMworks garden and regular education teacher, they communicated with each other and used this opportunity to create a positive experience for this child. The garden became the topic about which she could express herself through speaking in front of her class and writing. This helped her improve her self-esteem and connect with the other students in her class.

- A third grader in the "Let's Code and Invent" class was displaying unruly behaviors during the school day. He was crawling under desks, rolling across the floor, shrieking during instruction, etc. The classroom teacher mentioned this to the STEMworks instructor and together they came up with a behavior modification plan. The student then had to earn a set number of points to attend STEMworks class. At the start of this plan, the student missed a few classes, but quickly settled down to earn his way to STEMworks. STEMworks was a great motivator and game changer for this student.

Pukalani Elementary Strengths:

- ***Application of 1-2 years of skills in new environments:*** In Spring of 2019 and Fall 2018, STEMworks students were offered full day weekend workshops in robotics, Movie Making, prototyping and coding with Makey Makey. Students who didn't get their first choice in STEM classes were invited to these workshops. Students applied the skills they had been developing over the past one to two years in a variety of STEM areas (robotics, coding, movie making, graphic design, computer aided design and more) and when working with new peers in multi-age groups, all of the students flourished in the workshops. The workshop instructors were amazed by the elementary students' skills, passion, and ability to collaborate, communicate and share with one another throughout the full day courses.
- ***Community connections enable students to apply tools to produce products for variety of authentic purposes:*** Students in 3D Printing, Photoshop and Graphic Design courses planned, designed and produced a variety of products this fall that were useful for and shared with the students' community. For example, a student proudly produced an iPhone cover for her parent, students designed a t-shirt logo that they printed for their club (via industry partnership with instructor), students used their skills to design a flyer for King Kekaulike's Swing Dance Fundraiser that will be distributed to all the upcountry elementary schools, they produced a flyer soliciting help with ornament decorations for Pukalani school's winter assembly, and students designed and produced the Maui TEDx Youth Summit covers and advertisement posters, displayed in the upcountry Maui community, in collaboration with a KKHS senior student's project. Success with projects that serve the community will continue, by offering design services for events at Pukalani School. Students provided services in designing and producing flyers, stickers, t-shirts, etc. For example, Students created leadership buttons and bumper stickers that Pukalani school students earned. They practiced creating order forms and met deadlines as they would in a real business.
- ***Provides a safe place for students with challenges:*** One of the great things about the program is it gives students with additional challenges more opportunities for enriched learning, especially students exhibiting poor behavior. Behavioral issues can drastically effect classroom learning. In STEMworks AFTERSchool some of these students enjoy hands on activities involved in "STEM play" so much that they are able to listen more. Students also have further opportunities to practice working with peers in teams. Teachers and staff have also found that students are so excited about the program that they are also able to leverage it as an incentive for students to behave more positively throughout the school day.
- ***Training for instructors to help increase quality of student experiences and results:*** Six of Pukalani's STEMworks Afterschool program instructors took advantage of the STEMworks Professional Development training provided in September. Instructors collaborated, sharpened their skills in coding using micro:bits, learned advanced skills in video editing, were introduced to a wealth of resources to connect to industry experts, and were given lesson plans to utilize all the equipment found in the THINKits. Instructors came back to school energized, equipped, and excited to utilize what they learned immediately in their classes. Students were introduced to more activities that promote engineering design, practice professional skills, and connect to STEM careers and STEM skills. Two instructors attended a conference through Robot Mesh to learn Robot Mesh Studio for use in programming VEX IQ robots for competition which then supported a

very successful robotics season. The students were trained and produced codes that allow their robots to successfully perform with high levels of accuracy. The team made it to national-level competition.

Lanai High and Elementary Success Stories:

- One student was successful in Arduino coding of cars and robotics. She is shy yet very tenacious in her work. She has a quiet confidence that drives her to always find another challenge. She is sometimes the only girl amongst the boys and her tenacity and confidence shows more every time. She is very motivated to continue with coding and explore more opportunities through LHES & the program's community.
- Another student worked very hard also as he learned to code on his own. He was able to use C++ to make a game that he submitted for the STEM conference. He is also a quiet and shy student. He was tenacious in learning code and was very diligent in making changes to improve his code.

Lanai High and Elementary Strengths:

- **Peer mentoring:** Peer mentoring is a strength of the program, especially with a span of participants from second grade to seventh. Having multiple grade levels in a hands-on environment allows for mentorship between older and younger students. The students really enjoy helping one another with projects or tasks.
- **Homework completion:** Students are familiar with the daily routine of beginning the program with completing academic in-school subject work. Before jumping in to any STEM activities, students complete at least one subject's worth of homework. Program facilitators support students with their daily academic homework as needed.
- **Sustained Interest in Computer Science:** This semester, the program had several students begin with learning fundamentals in coding, hands on tools, like the Spheros, were instrumental in engaging and sustaining student interest in developing coding skills. Student interest in coding has continued and in the second semester students will begin integrating online learning with a code.org class. The integration of more online learning experiences, to develop student fluency in 21st century skills is an academic focus of Lanai High and Elementary in-class school site.

4.C.2 Best Practices

Based on several years of implementation and data, best practices include:

Providing Teacher Professional Development: Offering an array of professional development in technology tools as well as engineering design curriculum helps teachers build the skills necessary to engage student in STEM areas. Few teachers have experience in 3D printing, videography, coding, etc., but we want to expose students to these areas. Thus reoccurring professional development opportunities support teachers in building enough confidence and skill to 'jump in' alongside students. When possible the program hires instructors with STEM experience, but most often the program finds teachers that are excited, willing, and want to know more and learn how to teach STEM so that their students have these opportunities. Thus, the program recommends a willingness to build capacity in teachers at each site (rather than waiting for 100% capacity) as a part of developing a STEM program for students who need the opportunities right away. However, there often aren't enough teachers who are ready, interested, or have the extra time on top of a full time job, to teach STEM in an afterschool program- so including college students and industry professionals, when possible in professional development helps them to grow their teaching skills as well.

Offering tech workshops: Software or technology workshops can be instrumental in supporting a whole program in making technology gains more quickly so that students can spend more time on projects and less time on learning the tools; with many industry technologies (Adobe creative suite for videography/design/photography, CAD for 3D printing, etc.) there is a learning curve in how to use the tool before it can be applied. A workshop helps lots of students surmount this technological knowledge hurdle.

Using industry partners as facilitators: Whenever possible, industry partners are excellent sources of technical STEM skills in software and hardware, great sources of professional 'real world' experiences to share with students, have college pathway experiences and advice, can easily connect project content to a STEM field or real life example, and also provide unique points of view that professional educators may not be able to share.

However, industry partners often lack classroom and behavior management skills, so it's best to plan for smaller student to teacher ratios for them. Industry partners also have much more limited time to work with students, and a schedule/dedicated time to the program may shift based on week, month or semester.

Using college students as facilitators: When appropriate, college students may have excellent technical STEM skills in software and hardware that are applicable to current technologies that are being used in industry (and colleges). College students, being closer in age to participants, can be very strong role models for students and also get students really thinking about envisioning themselves in college too. College students' availability shifts by semester based on classes and coursework, but when available they have lots of energy and fresh ideas. College students benefit from having a site teacher as a "teaching mentor." Returning STEMworks program students have made excellent mentors.

Providing a broad array of STEM experiences. The breadth of opportunity of STEM areas correlates with a greater variety of student career interests. The larger array of offerings in STEM provided to students leads to a larger variety of career interests. Career exposure and software camps also correlate with students identifying specific career interests.

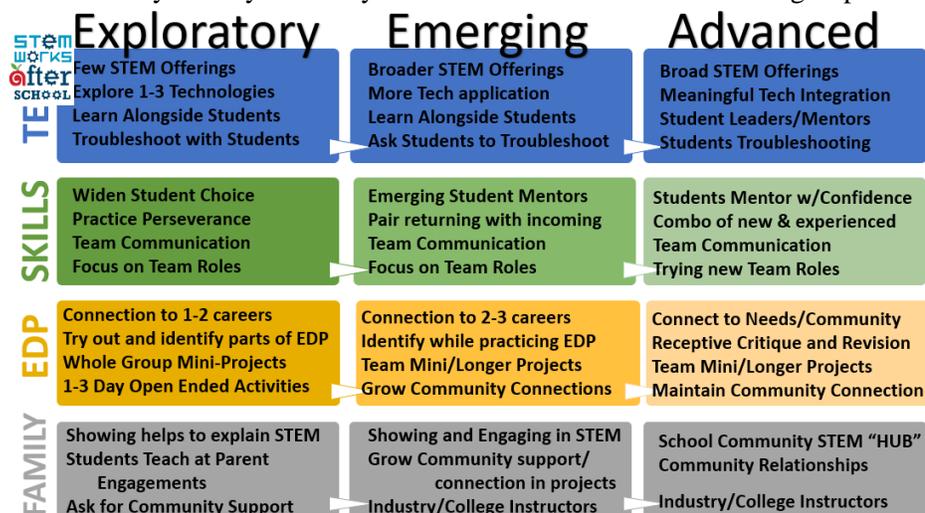
Providing academic support. Classroom/grade level teachers seem to be the most ideal to help students with their work; and having access to a variety of staff for academics helps (math teacher, ELA teacher, tech teacher, etc.). Many students avoid homework, so the best way to support students is to begin with a structure where all students work on academics first; after the structure of academic work time at the beginning of program is set, grade checks are a great way for students who are always/already doing well to move into enrichment with STEM right away. Students can also be encouraged to form their own study groups to help each other, which will be a valuable habit as they grow through high school and college.

Engineering Design Approach through multiyear growth: STEM programs take time to build and develop; student engagement grows with program experience and complexity. As the program matures, so does the skillset (and mentorship ability) of both students and teachers.

(1) *Exploratory*: Introductory year is an exploration where both teachers and students develop the skills and expectations of a student-centered engineering design program. In addition to learning via a process of research, design, testing, and redesign, all of the software is also new. It takes time to build both group skills and process-based problem solving for both students and teachers. The program is also new to parents, and developing a community understanding of STEM lays a foundation for valuing the kind of learning that takes place in the program. Students showcase their skills, since this builds ownership of learning and demonstrates growth in personal confidence. Administrators can help bridge connections to careers and academics for families.

(2) *Emerging*: The second year is a blend of experience levels. Year 1 of a program builds competency, confidence and a community that values STEM learning- creating a group of emerging mentors (both students and teachers), and also attracts new students and teachers to the program. In the classroom, what took a semester to get into a 'groove' in the first year may take only a month. This is because there is a group of students who already know

the routine of the engineering design process. Pairing 2-3 returning students with 1-2 new students in engineering groups is very helpful. If possible, allowing more overlap with site coordinators and year 2 teachers partnering with new teachers will also help. Year 2 allows for more depth. New students in year 2 will learn faster than the



year 1 students did, this is because now students learn from each other. In year 2 the teacher moves to spend more time supporting and monitoring and directing small groups in a facilitator role and spends less and less time on whole classroom direct instruction. Students spend more time on doing their own research, since the complexity of projects increases (there are students that have used the software in year 1 and are familiar with the design process). Year 2 is very focused on mentorship within the program, but is also a solid place to build lasting community partnerships, and with more connections with parents, volunteer numbers grow.

(3) *Advanced:* In year 3-4, the program develops into three experience levels: introductory, emerging and advanced. As the scope and focus of instructors in specific STEM programs becomes more defined, it is easier for the program to connect with meaningful partnerships, which may even include industry instructors, since both students and teachers are functioning at a higher level regarding the expectations of the program, the engineering process of completing projects, and management of student led STEM activity.

4.C.3 Student, Teacher, Parent, Staff or Community Input – *[if you used survey(s) please include instrument as an attachment and include results in the narrative.]*

At the beginning of each program year both parents and students are surveyed to inform program focus, which includes support needed for academics, homework, and a variety of career and professional skills within a variety of STEM offerings. Teachers meet to organize STEM class schedules, informed by the relative popularity of program offerings the previous year. In addition to continuing popular content, sites sometimes offer new classes based on availability of industry partners or volunteers that may be able to teach STEM specialties. Some data graphs from the Fall 2018 parent/student entry survey data are shared in this report. *See Appendix B for Parent and Student Program Entry Surveys.*

Although the goal is to move to iResults for more accuracy in reporting, as a back-up method: midyear, teachers document Fall grades in math, ELA and science for program students. At the end of the year, teachers document grades again in these three subject areas. Any grade improvement from semester 1 to semester 2 is counted as a ‘positive mark’. If students maintained an A, they also counted as a positive mark. If student’s grades were less than an A and remained the same or decreased at all, then this counted as a ‘negative mark’.

In quarter 4, an end of year survey is given to program students; outcome data from this 2019 student survey is shared within this report. Additionally, a general education Math or ELA teacher is surveyed for each program participant using the “End of Year Teacher Survey” (See Appendix C). Results from these surveys are shared within this report and will be applied to improve beyond the 21st CCLC grant into our sustainability model for each site as they continue program.

In quarter 4 site teachers were asked to reflect on aspects of their program and additional STEMworks AFTERSchool grant specific success/challenges/goals.

See section 6.B. below.

4.C.4 Pictures

Feel free to share any pictures you might have that show your 21st Century Community Learning Centers in progress.

Pukalani Elem (PES) Student Quotes:

"I learned more about Hawaiian Cultures through Aquaponics and the things we grew" – Grade 5

"I learned that Sometimes two hands are better than one." Grade 3

"I learned teamwork and to trust the judgment of my teammates." – Grade 5

"I can't always have my ideas used and if not used, I should not make a fuss." –Grade 1

"I learned that if you're going to get work done, you have to cooperate." –Grade 3

"I learned how to work on a team. I learned how to listen to others and to work out our ideas if they are different." – Grade 4

"I learned how to be coachable and accept feedback." – Grade 4

"I learned to try before giving up" – Grade 2

"To improve my team can spend more time together and try to think of ways to solve things." – Grade 4

"I think I'm good at the programming and I could help my team mates understand it better" -Grade K

"I've learned that by working together it makes it easier and better." – Grade 1

"My team members learned how to have a positive attitude and not give up when things go wrong." – Grade 4

"I learned to be nice to one another, you get more done that way" - Grade 5

Because of my participation in STEMworks, I know value or care more about... "Working hard, work with a teammate (Grade 3)", "Helping people (Grade 4)", "People and how they feel (empathy) (Grade 4)", "I care more about My voice in a project (Grade 1)", "I care more about Taking care of the things you work with (Grade k)", Food production on Hawaii (Grade 5)", "I care more about Other people's ideas (grade 3)".

Lahaina Inter (LIS) Student Quotes:

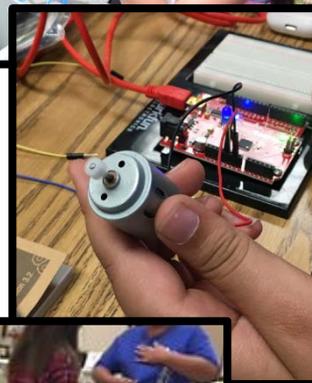
"I learned how to solve problems more efficiently. – Grade 8

"I learned how to take turns because it seemed that everyone was interested in one of the robots and we all wanted to play with it but we had to take turns. – Grade 7

"I learned that there will be problems we need to solve during our projects, we all learned cooperation when we disagree on something.." Grade 8

"I learned that having tighter deadlines encourage us to harder and faster"- Grade 7

"My friends learned cooperation, as before we would always disagree on topics and ideas." – Grade 8



work

"Being in a team is better than working alone." – Grade 6

Because of my participation in STEMworks, I know value or care more about... *"creativity and making projects more about fixing global problems. (Grade 8)", "Other's opinions (grade 6)", "Teamwork (Grade 8)", "I care more about My work because it is really important and STEM has shown me that. STEM really changes people's life. (Grade 8)", "I care more about the creation of professional products like videos, games, and various pieces like music (Grade 7)", "I now care more about the safety of our environment. (Grade 8)".*



Maui Waena Inter (MWIS) Student Quotes:

"One specific example that I learned from my team is that without them I wouldn't be able to find a better solution." –Grade 7

"Our team can improve by allowing more collaboration, and let others know what is wrong so they can help." –Grade 8

"I was in a group with people who were really good at After Effects so I was able to learn how to be better at transitions and animation." - Grade 8

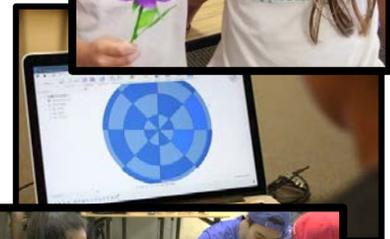
"I learned that certain codes can cancel out other certain codes when designing a game." – Grade 7

"To improve my team's success we can work on our time management."-Grade 7

"To improve as a team we could set times so we finish a certain part in a certain amount of time." - Grade 6

"Something that my team could do to improve the performance of a project is to teach other people what they know what to do so they can also provide quality work." – Grade 8

"My team members have learned from me that it's important to give constructive criticism while still being kind about it."- Grade 7



Because of my participation in STEMworks, I know value or care more about... *"I now care more about my time management (Grade 8)", "I care about my future (Grade 7)", "My community and how I should take care of it. (Grade 8)", "I care more about the opinions of others. (Grade 6)", "news stories and events in my community. (Grade 8)", "I care more about the importance of being on task and becoming a responsible person in a group. (Grade 6)", "I now value or care more about my education (Grade 7)". "I care more about How to become a leader, a better person, learning from my mistakes, getting my job done effectively and*



successfully, my ability to do something and even if I get it all wrong to pick myself up and try harder and finally I care most about how I continue to persevere through learning and finding new solutions (Grade 7)."

Lokelani Inter Student Quotes:

"I learned how to work with different people that have different experiences" – Grade 8

"I learned how important it is to have trust in people."- Grade 6

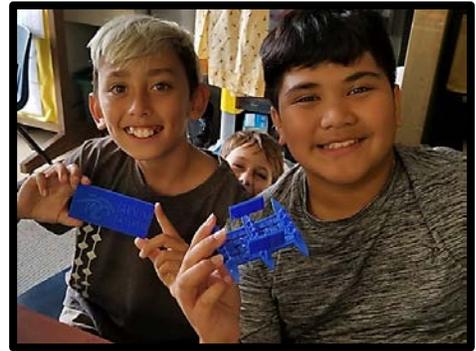
"I learned how important it is to have trust in people." –Grade 6

"I have helped people in a positive way by helping others be more strong minded." –Grade 8

"I care more about my surroundings and nature." Grade 6

"From me, my team learned to become a hardworking person and to not take what others say directly to heart" –Grade 8

"I learned what we would need to start our own business"- Grade 6



Because of my participation in STEMworks, I know value or care more about... "Being a leader and advising others (Grade 8)", "I now value the Importance of having a leader and good team participation (Grade 8)", "I care more about education (Grade 6)", "I care more about others peoples work, their likes and dislikes myself (Grade 7)", "I now care more about the planting of Native Hawaiian Plants (Grade 8)".



Lanai High and Elem (LHES) Student Quotes:

"To improve I think we need to stay focused."- Grade 3

"I helped others try their hardest."– Grade 7

"Advice for my team, don't limit yourself"- Grade 7

"I have used a lot of different apps and programs to make video games." – Grade 3



Because of my participation in STEMworks, I know value or care more about... "Believing in myself (Grade 7)", "I now care drone and learning more about games (Grade 3)."



more about

5. Sustainability Plan

5.A ORIGINAL SUSTAINABILITY PLAN

Describe the original sustainability plan as indicated in the grant application.

The original plan to sustain the program beyond the initial award period was for MEDB and partners continue to build a strategic plan that would leverage the funding from its STEM core budget, which includes MEDB personnel costs. This core funding was intended to be buttressed by MEDB's Ke Alahele Education Fund. MEDB planned to foster ongoing collaborations with its extensive network of industry partners to continue pro bono training, mentoring, career shadowing opportunities, engage program participants on the advantages of staying in the higher education STEM pipeline, and ongoing technical assistance in developing aspects of the program's career-focused curriculum. MEDB's projections were based on remaining a dedicated line item in the Maui County budget, and directing some of this annual funding to support the AFTERSchool program continuation, and to retain staff.

MEDB relied on national partners Trimble Sketchup and ESRI Geospatial software to maintain their agreements and continue to provide free resources to program participants. DOE school partners agreed to maintain the campus dedicated space to continue the afterschool delivery. MEDB pledged to continue to cultivate prior participants and train them as mentors for future participants.

5.B UPDATED SUSTAINABILITY PLAN

Describe how programming levels will be sustained after the grant ends, including:

- *What changes were made from the original sustainability plan?*
- *What community partners have been added?*
- *What community partners have dropped off?*
- *Describe any additional funding sources.*

Our updated plan to sustain the program beyond the initial award period is to continue leveraging funding from our STEM core budget (federal, state, county, and private funding), which includes MEDB personnel costs and offset future costs by exploring fee models. MEDB will continue fostering ongoing collaborations with its extensive network of industry partners to continue pro bono training, mentoring, career shadowing opportunities, engage program participants on the advantages of staying in the higher education STEM pipeline, and ongoing technical assistance in developing aspects of the program's career-focused curriculum.

MEDB continues to be a dedicated line item in the Maui County budget, and plans to direct some of this annual funding to support the AFTERSchool program continuation, and to retain staff. This budget enables program sites to continue to offer STEMworks AFTERSchool at Maui County sites. Additionally, a relationship between MEDB and Boys and Girls Club Maui enables the STEMworks AFTERSchool robotics program at Lokelani to continue through the summer of 2019, developing a partnership into upcoming school years with a potential for reaching more schools. Supply inventory from the 21st CCLC grant remains at each site to continue to be utilized through upcoming program in STEMworks AFTERSchool in future years. Past training for site coordinators, instructors and volunteers, supported by the grant and leveraged by MEDB resources, was an investment that can now contribute to long term sustainability in competency to deliver STEM program at the sites.

MEDB relies on national partners Trimble Sketchup, Code.org, Microsoft, National Geographic, ESRI Geospatial software to maintain their agreements and continue to provide free resources to program participants. MEDB will continue to cultivate prior participants and train them as mentors for future participants.

In addition to its national partners, MEDB has nurtured a number of new Hawaii-based partnerships, which have a direct impact on the STEMworks program. These partners include the CIO Council, Pacific Center for Advanced Technical Training (PCATT), CSTA, Hawaii-based technology/energy/agriculture companies, NOAA, and more. STEMworks is also the Regional Partner for Code.org, training K-12 teachers in computer science curriculum. The program has the sustainability to create a pathway from career exposure, career exploration, internships, and eventually college/and or career readiness is the goal.

The staffing of individual community volunteers varies each semester based on the shifting availability of those individuals. See the Partnerships section of 3.E.2 section on Resources and 3.G. Partnerships above.

6. Conclusions and Recommendations

6.A CONCLUSIONS

- The program effectively engaged the intended participants.
- The program provided high-quality services supporting core subjects, including math and science education and reading.
- The program provided high-quality, hands-on, technology-based enrichment activities to participating students. Site observations; surveys of students, parents and teachers; planning meetings with teachers and administrators, and consultation and collaboration with community partners, all indicate that the program activities are useful, relevant, interesting, valuable and engaging.
- The program met expectations regarding the delivery of family engagement activities.
- The program excelled at involving community partners (private business; federal, state, and county government, institutions of higher learning) and generating in-kind donations of personnel hours or software.
- The program continues to reap an appreciable benefit to the program deriving from experienced teachers, and also from experienced students who can function as mentors and elevate the overall sophistication of program offerings.
- Based on the self-reporting of students, program participants at all sites benefitted in a wide range of academic and job-readiness and life skills.
- The program is meeting or exceeding expectations for family engagement, improving student performance in the areas of classroom participation, homework completion, turning in homework on time, classroom behavior, and attendance. In all cases, a high percentage (minimally 88%) of attending students showed improvement in all four of these measured student-performance areas, with those attending the program for at least 30 days showing more improvement in behavior and attending class regularly.

- In every participant school providing data, teachers report marked improvement in participants' school day performance in the core subjects of math and language arts. The available data shows program-wide impacts of improvement as follows: 75-100% math, 65-100% ELA. Within the population of students participating in MEDB programs, the achievement gap typically present between SED and non-SED students was overcome.
- In addition to meeting or exceeding 21st CLCC standards for program success, the program met its self-created, program-specific objectives regarding teacher-assessed academic improvement, student interest in STEM careers, student perceptions of mastery of the engineering design process, and family participation and engagement. The program is still working towards meeting its program-specific objectives regarding student self-assessed academic improvement (met in math and in progress for other subjects), confidence in their abilities to complete tasks and achieve goals (goal of 90% currently at 70-86%); work well and collaborate with others on a team (goal of 90% currently at 80%).

6.B RECOMMENDATIONS

It is recommended that the program:

- Continue to its successful methods of increasing the challenge/sophistication level of STEM offerings so that experienced students move beyond the initial skill-building orientation of prior years.
- Continue to experiment with the balance of program reach (number of students) and curriculum depth at programs where demand outstrips capacity.
- Continue to experiment with providing students more feedback on their improvement and to bring their self-assessments more into alignment teacher assessments (this evaluation process consistently indicates that students are under-estimating their improvement). Explore whether the issue is a culture of humility about self-reporting achievement.
- Strongly consider closing the program on Lanai (where another program is serving the same population) as participation numbers are unsustainably low despite considerable effort to engage students.
- Continue to implement its evaluation plan as structured, while taking the next year to review the evaluation plan and former reporting requirements and recommend any appropriate adjustments, with reports now being generated for and reviewed by the Project Director and MEDB board.
- Continue to provide summarized data from survey instruments from each site to all staff from the respective site during informal site visits so that this information can shape the program and its delivery, including by further revising data collection instruments to best serve the goals of the program and the individual sites.

6.C EVALUATION DISSEMINATION

This full report will be distributed to the school principals and site coordinators of each participating school. The executive summary and a summary of resources devoted will be further disseminated via the STEMworks website. The STEMworks website also posts updates, information and forms about program, rotates a showcase of some student work, and shares future opportunities for students and families. and via flyers sent home with students and distributed at future family engagement nights, and meetings with community partners.

“By the Numbers” is a community flyer to be distributed at 21st CCLC STEMworks AFTERSchool Family Engagements & emailed to families, STEMworks community events, to Maui Economic Development’s Board of Directors, posted on STEMworks website, included in STEMworks e-newsletter to community- which includes teachers, administrators, parents and legislators.

Future STEMworks AFTERSchool Family Engagements include distribution of program information via formal presentations, program schedule flyers and personal conversations about program activities. The future plan includes students taking on a role in sharing their learning and teaching STEM program activities.

Program data is shared with the community on the STEMworks website here, <https://www.stemworkshawaii.org/afterschool>. The program also utilizes a tool that allows for interactivity and sharing of data with the community via Qualtrics, an industry recognized data management software. Community can click on each graph or school to view interactive data from the culminating student survey for STEMworks AFTERSchool here:

1. Website: <https://www.qualtrics.com/login/>
2. Login: stemworksdashboard@gmail.com
3. Community Share Password: stemworks

