HUDSON RIVER
COMMUNITY SAILING

Youth Development Programs Report

2014-2015

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Part 1 Report Summary

- HRCS works with over **120 students from 8 partner high schools** each week over the academic year
- Our students show **higher academic achievement** than their peers not in the program. (See Outcomes Analysis)
- HRCS programs positively impact students' development of **leadership skills** including self-confidence, communication and teamwork. (See Outcomes Analysis)
- Our students gain a unique exposure to hands-on work through boat building and job skills through internships
- In 2015-2016, students in the 2nd year will have the opportunity to take part in a credit-bearing Ocean Literacy curriculum

"Your program combined trust, challenge, and high expectations to such a great extent that every student left the program feeling proud of their accomplishments. Their pride and resulting self-confidence manifests itself in many ways that could easily go unnoticed." - John Schaefer, Math Teacher, The James Baldwin School

Outcome Report Card

Based on the results from the year, program directors and coordinators gave each outcome a grade based on how well the outcome was achieved.

Sail Academy	Success	Partial Success
1. Increase proficiency in math and science as compared to peers cohort	✔	
2. Improve communication and teamwork skills	✔	
3. Foster a greater interest in mathematics and science		✔
4. Foster fact-based and independent decision-making	✔	
5. Develop confidence and competence operating sailboats	✔	
6. Increase literacy through experience recording and reflecting	✔	
7. Expose students to college and career options, particularly in disciplines that require math and science skills	✔	
First Mates		
1. Build a dedication to homework completion, such that grades continue to improve	✔	
2. Be empowered as role models and mentors for younger students	✔	
3. Deepen interest in math and science and increase ability to use scientific method and learned content to solve problems		✔
4. Earn certifications from accrediting organizations to demonstrate growth in sailing skills		✔
5. Gain career awareness through internships and exposure to HRCS Member speakers	✔	
6. Receive support for the college application process		✔

7. Gain a deeper awareness, appreciation, and responsibility for their local environment and ecosystems.		✔

Part 2 Report

The Programs

After School Programs

Grade	Program	Students Served	Scope and Schedule	Content
5-11 (Summer)	City Sail	300	One week, Mon-Fri, 9a-4p	Basic math/science, leadership, feeder/intro program
9	Sail Academy	75	4x/month, 3 hr/session	Learning math/science through sailing/boat building, earn credits
10	First Mates	35	4x/month, 3 hr/session	Career exploration, Safety on Water/Safe Boaters License
11	First Mates	25	4x/month, 3 hr/session	College Exploration, Basic Keelboat Certification
12	First Mates	20	4x/month, 3 hr/session	College application, sailing unassisted, Capt License, Teaching skills

Internships (Summer, Fall/Spring for some)

Time Frame	Program	Students Served	Scope and Schedule	Content
9/10	Leadership Intensive	20	2 weeks, Mon-Fri	Leadership, effective communication, team coordination
10/11	Junior Educators	10	5 weeks, Mon-Fri	Basics of instructing, teaching skills, safety
11/12	Office/Water front Intern	5 - 8	Weekly schedule during sailing season, 10-20 hrs/week, paid	Customer service, boat repair and maintenance, office management, dinghy operation
12/ College	Apprentice	5 - 8	Weekly schedule during sailing season, 10-20 hrs/week, paid	Assistant instructor on public sails with adults and families. Independent boat repair and maintenance tasks

Program Description

HRCS recruits students entering their first year of high school, and, through its yearlong after-school program *Sail Academy* (SA), provides the opportunity to earn academic credit in mathematics and physical education. Additionally, students learn the important life skills of teamwork, self-reliance, and persistence, both on our boats and in our classroom. Our curriculum was designed with NYC Department of Education partner teachers to support state standards.

After successfully completing *Sail Academy*, students can continue in *First Mates*, a program that provides youth development experiences that prepare them for college and the workplace. With the help of a strong volunteer corps, *First Mates* develops expertise in sailing, marine science, boat building, navigation, and racing. We also provide students with ongoing mentoring and academic tutoring.

The final element of Youth Development at HRCS is our four-tiered *Internship Program*. Internships provide students with more responsibility and independence, and include experience in a working office and marina. Our students rely on this part-time income to support themselves and help their families.

Program Outcomes/Goals

The five primary goals of the youth programs at Hudson River Community Sailing are summed up by the **CLASS** acronym. Each year of the programs focuses on all five of these areas in increasing detail.

C - College/Career Readiness
L - Leadership
A - Academics
S - Sailing Skills
S - Stewardship

Program Outcomes

Sail Academy

1. Increase proficiency in math as compared to peer cohort
2. Improve communication and teamwork skills
3. Foster a greater interest in mathematics
4. Foster fact-based and independent decision-making
5. Develop confidence and competence operating sailboats
6. Increase literacy through experience recording and reflecting
7. Expose students to college and career options, particularly in disciplines that require math skills

First Mates

1. Build a dedication to homework completion, such that grades continue to improve
2. Be empowered as role models and mentors for younger students
3. Deepen interest in math and science
4. Increase ability to use scientific method and learned content to solve problems
5. Earn certifications from accrediting organizations to demonstrate growth in sailing skills
6. Gain career awareness through internships and exposure to HRCS Member speakers
7. Receive support for the college application process

Program Highlights

Fall Expedition to the Statue of Liberty, Caven Point Bird Sanctuary - 11/04/14

Every year in early November, we have a “trip day” around the Statue of Liberty to Caven Point Bird Sanctuary. During the sail, students take windspeed, boatspeed, and tidal observations. After rounding the Statue, we anchor our boats, have lunch and explore the bird sanctuary. Closed to humans

during mating season, this wild area of land is open during the winter months and gives students a real sense of adventure with a view of Manhattan on the horizon.

City Island Transit
A group of 8 First Mates helped HRCS on the final sail of the season. Two boats of First Mates made the six hour sail to City Island where we store the boats for the winter. Students marveled at the beautiful views of the city as they explored the new waters of the East River and the head of the Long Island Sound. As the sun began to set the rapidly cooling air was a brutal reminder of how important it is to dress appropriately and layer!

Trip to Fort Lee Park
On Tuesday November 11th, 2014 students boarded our boats bound for another exciting expedition. This time our sights were set on the base of the George Washington Bridge where Fort Lee Historic Park resides. Greeted with a beautiful day of sailing, students calculated boat speed, spotted landmarks such as the palisades and Grant's tomb. Once anchored at the bridge we ferried ashore and embarked on a short hike to the top of the palisades.

The Windmill
The Windmill has been put on hold while newer students honed their tool skills on the chair project. A plan will be in place before the upcoming school year with a timeline to finish the windmill. Most likely this will occur outside of regular program hours to make time for our other areas of focus.

Safe Boating Certification
This fall we brought a NYS Safe Boating instructor in from Instruct NY. Thirty students participated in two different three hour lecture sessions and then took an exam. Topics covered included basic navigation, engine maintenance, hull design, and laws. 24 students passed the exam and now have their first certification through HRCS.

Building of the Optimists - Started December 8th, Launched May 2nd
In early December our winter "trimester" begins and we shift our location to 18th street, and our attention to boatbuilding. Between December 8th, and May 2nd, the students built two seaworthy Optimist dinghies.

Folding Beach Chairs
In order to teach new woodworking skills to our large group of sophomores who need instruction on things like laminating wood, bending wood, and planing, we completed a training project making folding wooden chairs. Operations Director Chris Green prepared plans incorporating all the skills our new students would

need. Once the frames were completed, we needed to create something to sit on. Students learned to sew and utilized used sails to make the back rests and seats for our chairs.

Career Speakers

The third week of every month is now “Career Speaker Week” where friends and family of HRCS come in to share not only what they do for work, but the path that got them there. We encourage professionals from all walks of life to show students the many different available.

Boat Show Field Trip

In January, students took a field trip to the New York Boat Show at the Javits Center. Students used this opportunity to identify and analyze different hull designs, dimensions and engines, which they then used to calculate the hull speed of various boats

Youth Programs Graduation 6/19/15

Students, families, staff, board members, principals, teachers, and supporters came out to celebrate the amazing accomplishments of the 2014-2015 Youth Development Programs. Students showcased their work from the year before being recognized for their achievements. Seniors Stephanie Gonzalez and Noa Yoder spoke about their 4 years at HRCS and how much they had learned and grown. The ceremony closed with the students holding their bracelet-clad arms in the air and repeating the HRCS Pledge "Explore, Dream, Discover".

Final Expedition to Inwood - 06/04/15

Every year, our final “trip day” is our chance to show the kids why sailing is the ultimate form of transportation. This year we sailed a 20 mile round trip journey, docking at our new location in Inwood for lunch and a nature walk in Inwood Hill Park. The long day gives students time to settle into the marine environment and put all of their newly acquired skills to the test.

Final Expedition to Irvington Boat Club - 6/20-21

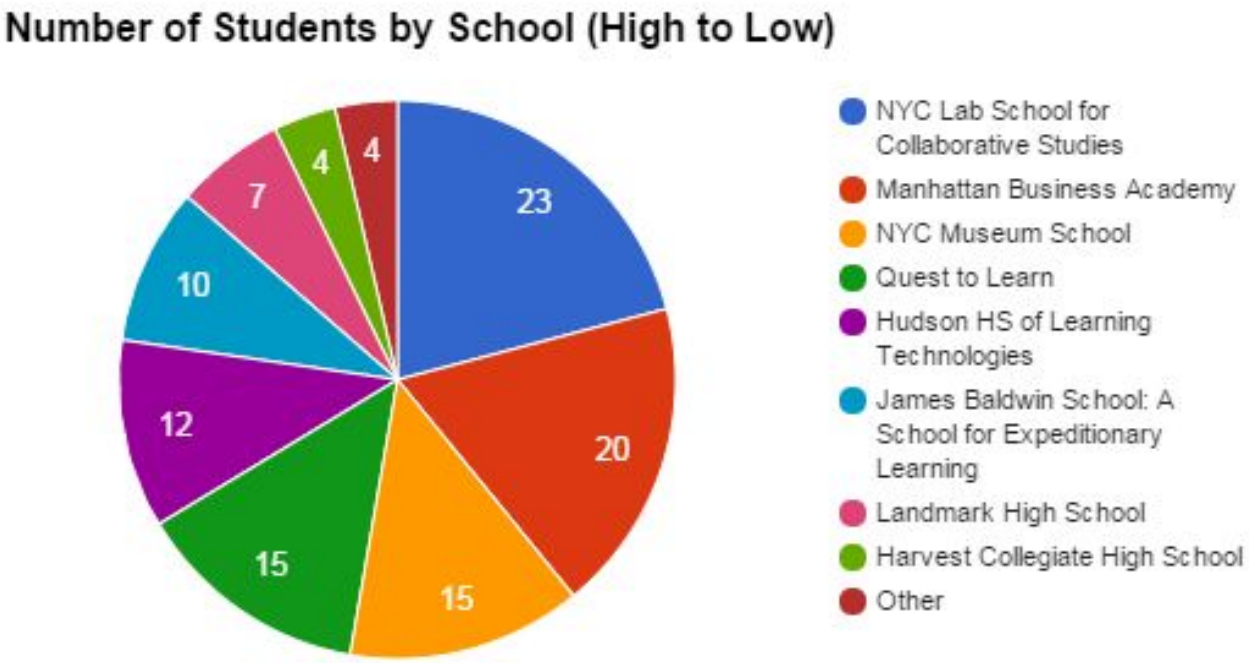
The First Mate program sailed to Irvington Yacht Club for an overnight expedition. The trip was 40 miles in total and included group reflection, frisbee, cooking, and a beach bonfire at night. Senior and Junior students slept on the boats, with staff supervision, while Sophomores slept in the boat house. There was an excellent turnout of students, staff, and volunteers, with over 25 people making the trip.

College Visit and Sail Team Practice at SUNY Maritime

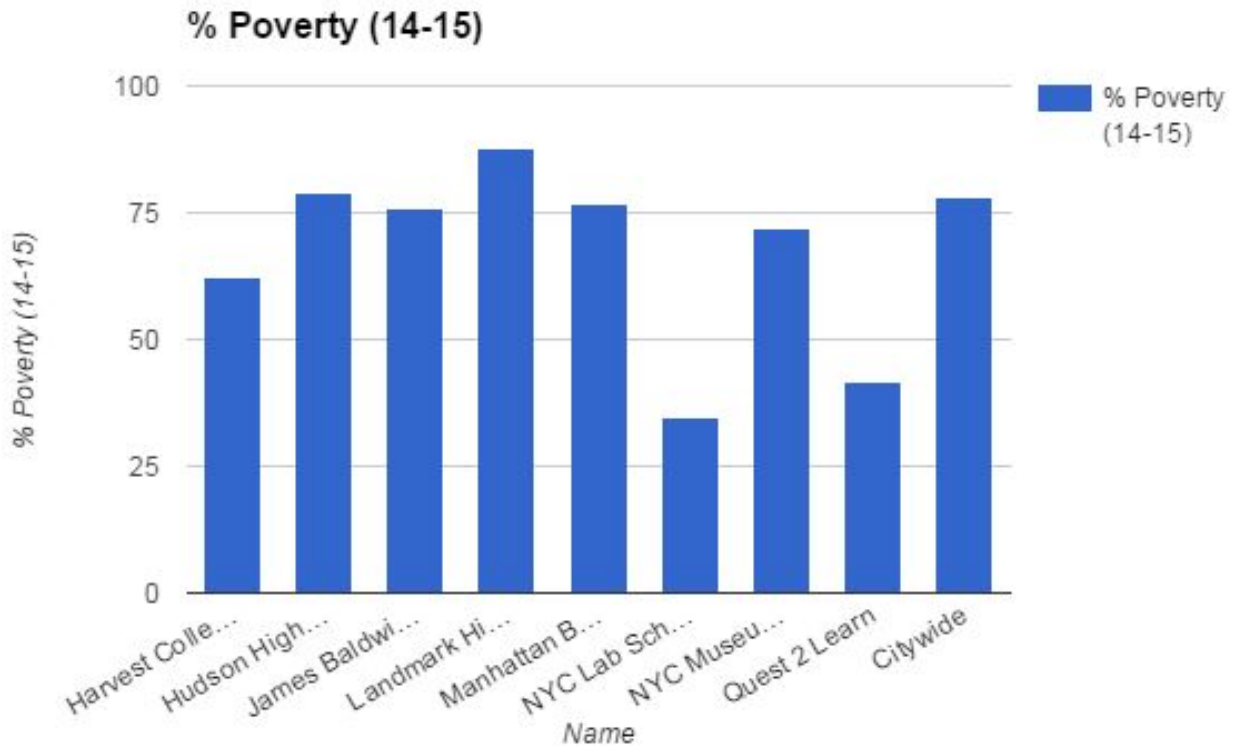
A group of First Mates visited the SUNY Maritime campus where they received a tour of the campus from members of the dinghy sailing team. They they got the chance to practice with the sailing team in 14' boats.

Alumni Visit

In January, all 8 graduating seniors from the class of 2014 came to the boat house over their winter break to meet with current students and tell them about college life as well as how the program impacted them.

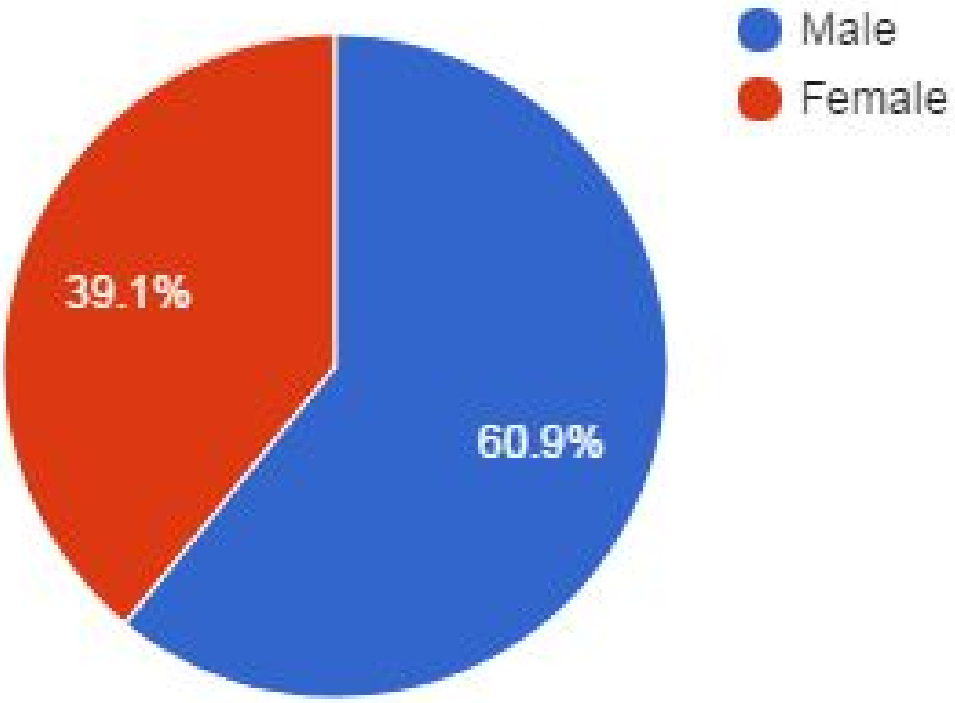


Participants

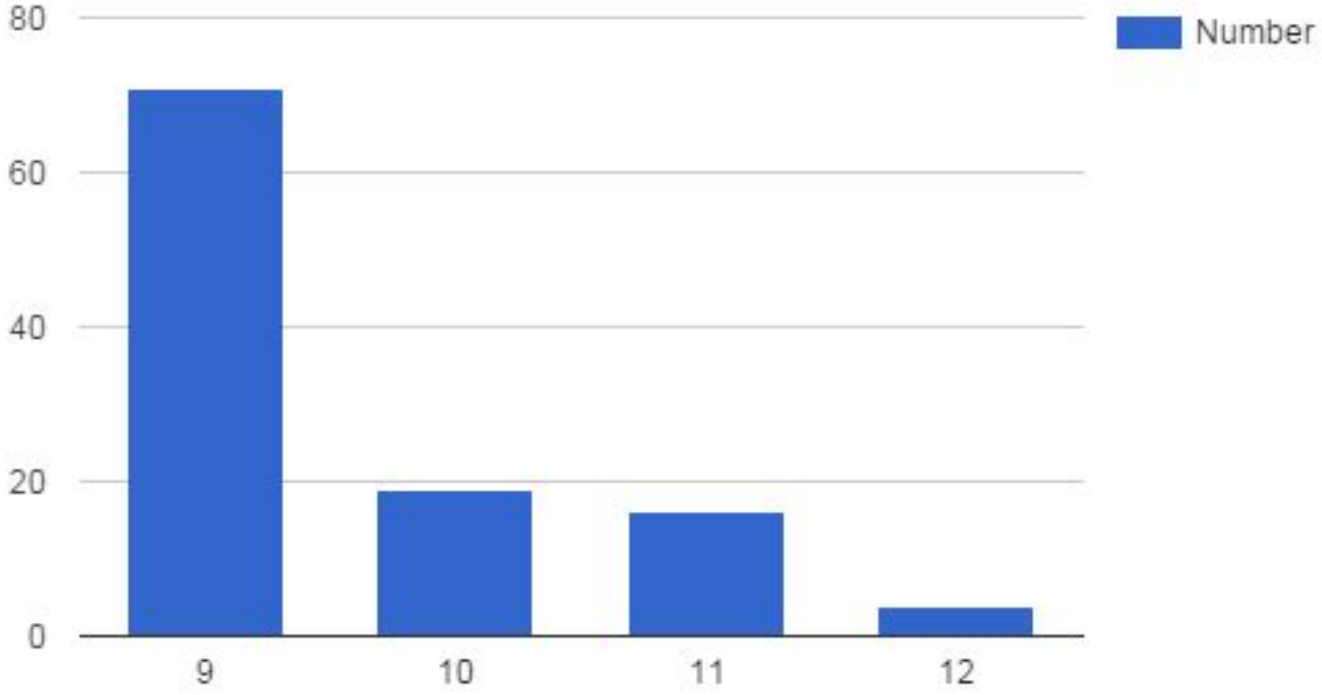


Our goal is to serve students with high needs. We also believe it is important to have a diversity of backgrounds in our programs.
NYC DOE “Poverty” counts are based on the number of students with families who have qualified for free or reduced price lunch, or are eligible for Human Resources Administration (HRA) benefits.

Gender Mix



Number of Students by Grade



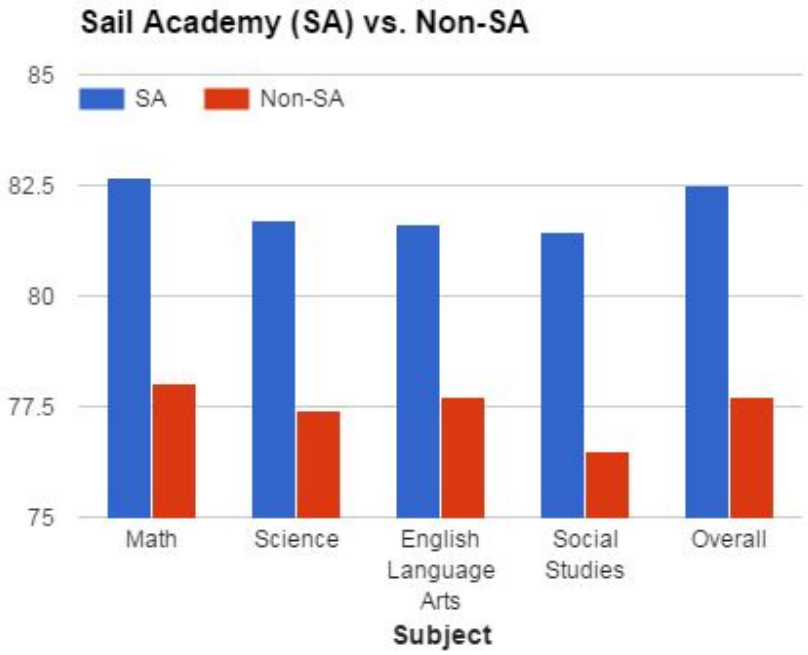
Outcomes Analysis

Sail Academy

1. Increase proficiency in math as compared to peer cohort[1]

- On average, students in program scored 4.7 grade points higher in math than their peers:

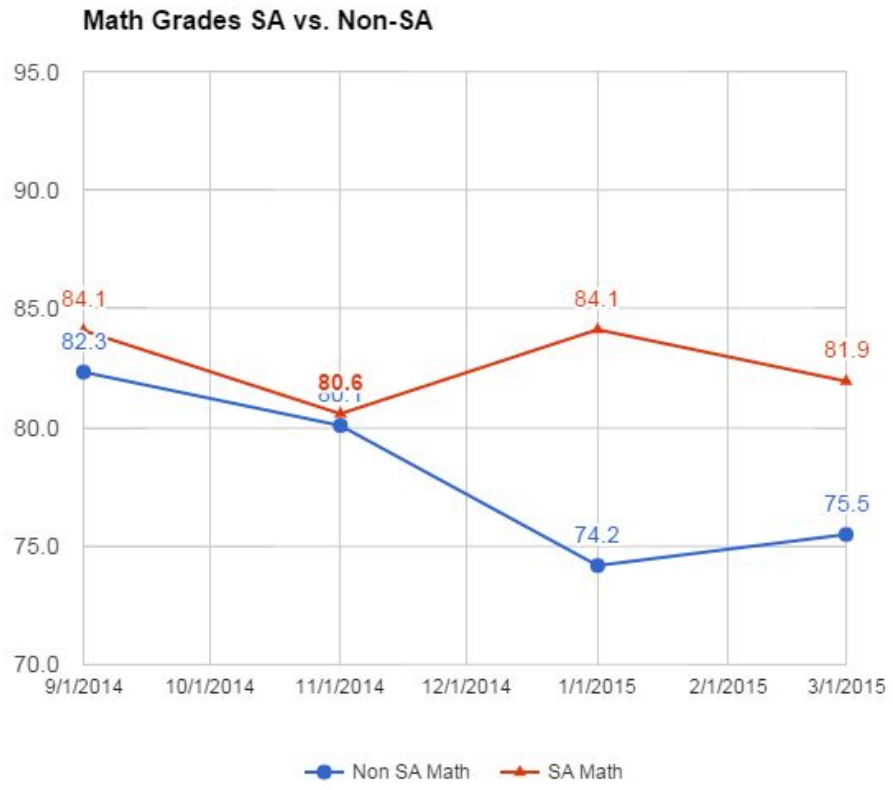
Graph G1



- Math grades of students in program stayed relatively steady while peer grades steadily decreased
    - SA students' math grades compared to their peers' averaged 1 point higher during the first half of the program vs. 8 points higher in the second half of the program
- Students showed a 27% increase in their HRCS Diagnostic test from September to June

Table G2

[1] "Peer Cohort" or "Non-SA" is defined as students who began the program but dropped out. This group represents all 8 partner schools. While this comparison is not perfect, it does provide a contrast.



"The sailing programs relate math to the real world. This is something our high school math teachers strive for every day during school. For us, HRCS has been huge."

– Karen Polsonetti, Principal, Manhattan Business Academy

2. Improve communication and teamwork skills

- **85%** of students reported agreement (Strongly Agree or Agree) with the statement "After participating in Sail Academy, **I work in a team better**" on the Survey taken three times throughout the program (November, March, June)
- **83%** of students reported agreement with the statement "After participating in Sail Academy, **I am more willing to take on new challenges**" on the Survey

Student testimonials about communication and teamwork skills:

- *"Through this program I was able to make my voice and ideas heard. It is really hard for me to put my thoughts into words but now I am better at it. Also, I am kind of a wallflower, and being here and working with people I do not see everyday really has helped me socialize with other people than my group of five friends."- Alexis Fuchs, NYC Lab School for Collaborative Studies*

- *"I learned how to better myself as a human, leader and a friend. I like to help my friends out, whether it be with manual labor while building the boat, or with math problems assigned to us during the program. I feel more inclined to finish projects, for example the goal at hand, which is to build our boat!" - Brad Pion, James Baldwin School: A School for Expeditionary Learning*

3. Foster a greater interest in mathematics

- **92%** of students reported agreement with the statement "After participating in Sail Academy, **I am enjoying learning new things**" on the Survey
- **53%** of students reported agreement with the statement "After participating in Sail Academy, **I am more interested in math or science**" on the Survey

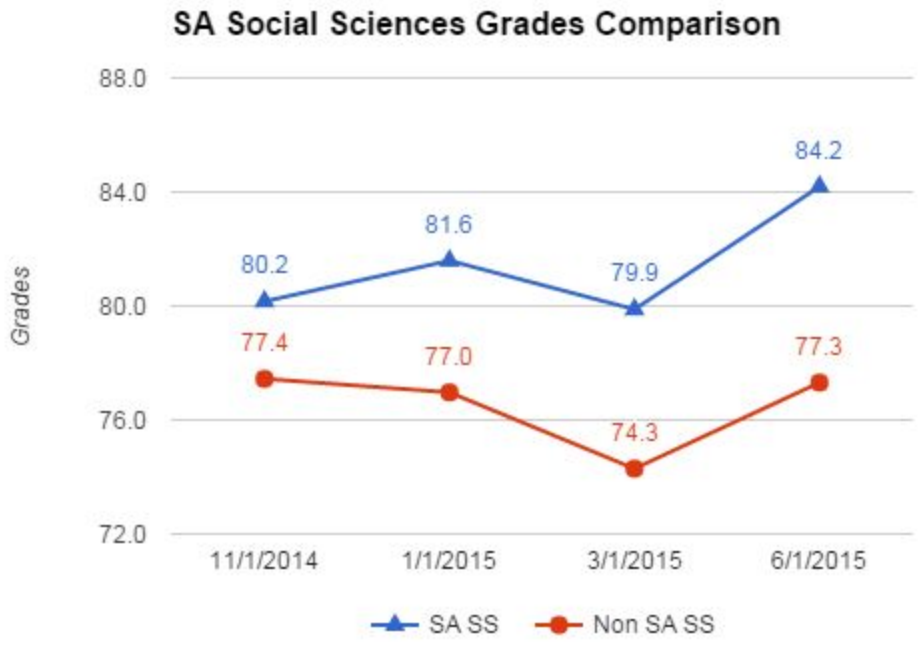
Student testimonials about discovering a greater interest in math:

- *"In the program, I learned to have fun doing what you like, for example learning science and math." - Zulma Sanchez - Manhattan Business Academy*

- *"Behind sailing there is a decent amount of math that is required for the sailing ...as in maybe the direction that you are sailing in, or maybe the speed that you thought would be needed to get through a certain passage." - Kenneth Luna, Landmark High School*

4. Foster fact-based and independent decision-making

- *Sail Academy* students' Social Sciences grades showed an improvement of 4 points throughout the program while their peers' grades remained unchanged



- **77%** of students reported agreement with the statement "After participating in Sail Academy, **I make up my mind by gathering information rather than assuming what someone says is true**" on the survey

Student testimonials about learning fact-based and independent decision-making:

- *"I am now able to make up my mind and not relying on other people" - - Alexis Fuchs, NYC Lab School for Collaborative Studies*

- *"I learned how to use S.M.A.R.T goals to guide my decisions" - Dario Arias, Quest to Learn*

5. Develop confidence and competence operating sailboats

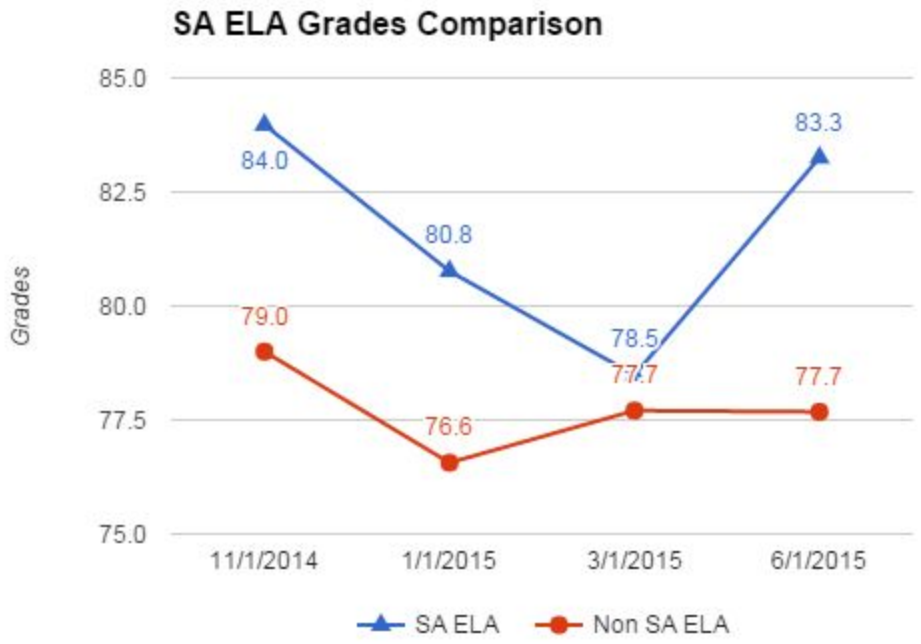
- Nearly **60 students** took part in Fall and Spring Expeditions which challenged their sailing skills on a longer-distance sail

Student testimonials about confidence and competence operating sailboats:

- *"I was able to experience what it's like to be on the water and understand which way the current was and what upwind, downwind, brackish, ebbing, and flooding meant. I also learned how to tie a bowline knot, as well as several other knots" - Max Sano, NYC Lab School for Collaborative Studies*

6. Increase literacy through experience recording and reflecting

- Sail Academy students' grades in English were consistently higher than those of their peers



- **70%** of students reported agreement with the statement "After participating in Sail Academy, **I can reflect on each day using my journal**" on the survey

Student testimonials about experience reflecting and recording:

- *"I learned the importance of journaling/ reflecting on what happens throughout the day" - Anna Liang, NYC Lab School for Collaborative Studies*

7. Expose students to college and career options, particularly in disciplines that require math skills

- **80%** of students reported agreement with the statement “After participating in Sail Academy, **I have a greater awareness of college and career possibilities**” on the survey
- **Monthly** career speakers in program from a variety of careers

Student testimonials about college and career exploration:

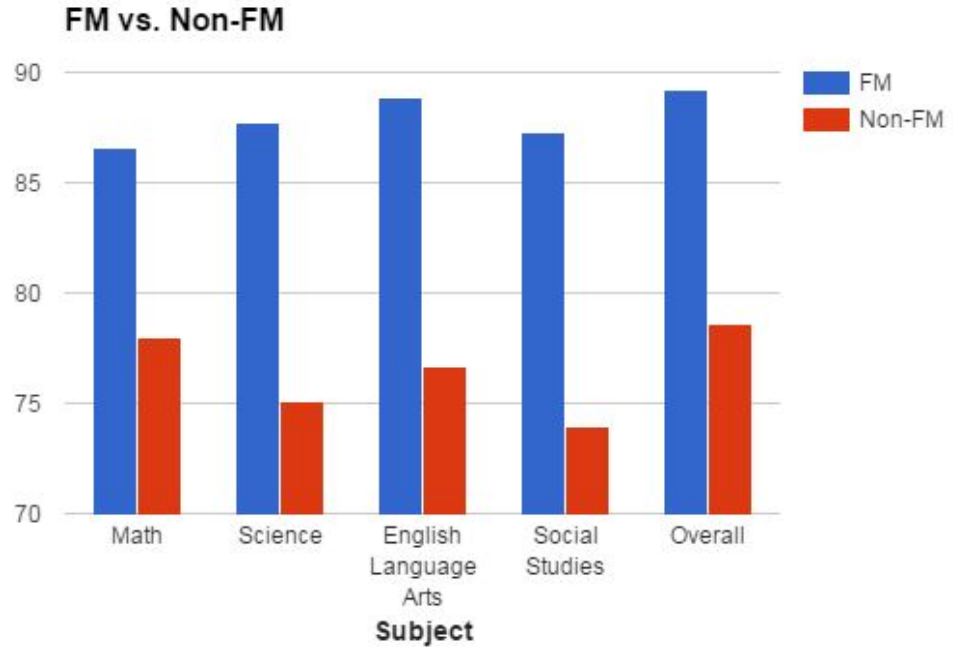
- *“I was able to get insight about my future and college through career speakers” - Fabian Aguilar, Quest to Learn*

First Mates

1. Build a dedication to homework completion, such that grades continue to improve

- On average, First Mates scored 11.6 grade points higher than their peers.

Graph G2



Student testimonials about homework completion and grades:

- *”I have better time management now that I have to balance school and sailing” - Christina Deng, NYC Museum School*

2. Be empowered as role models and mentors for younger students

- Students took leadership roles and prepared some basic sailing lessons to impart their knowledge and experience on to Sail Academy students. Students then worked in small groups to teach these lessons. The information was well received by Sail Academy students

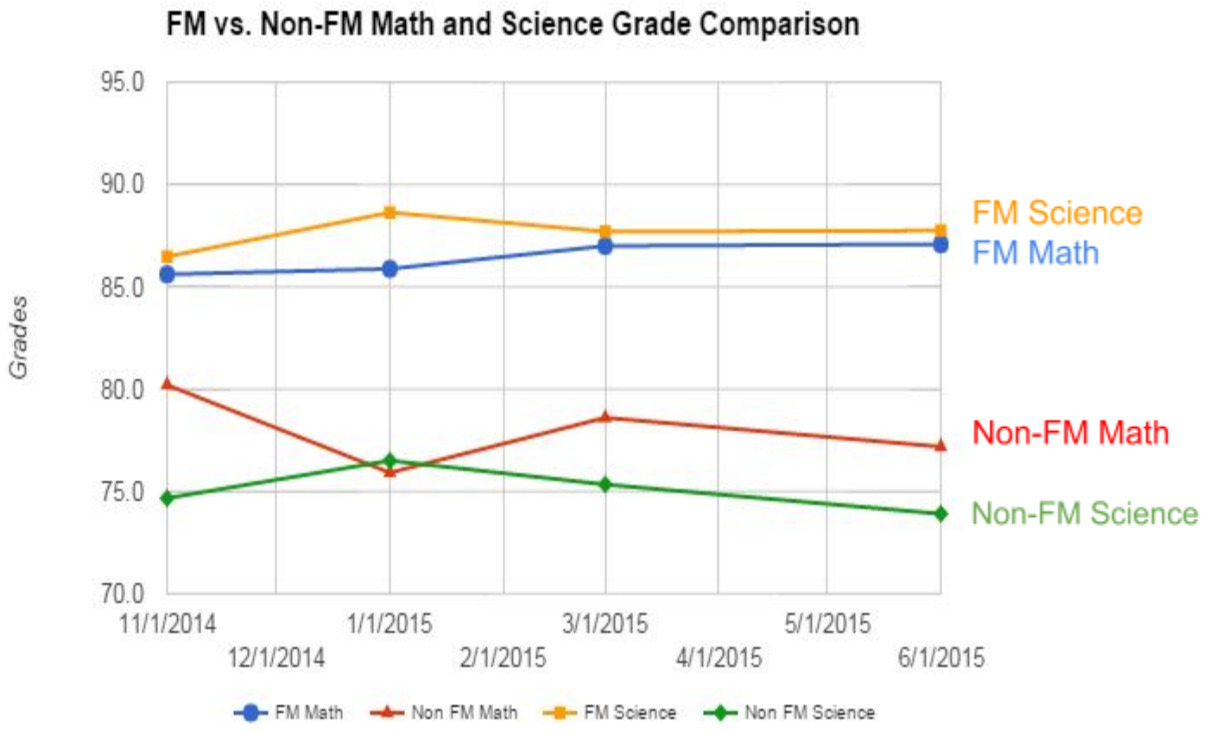
- **82%** of students reported agreement (Strongly Agree or Agree) with the statement "...I feel like a better role model to those younger than me in the program" on the survey taken three times throughout the program
- **74%** of students reported agreement with the statement "...I have stronger teaching skills" on the Survey

Student testimonials about role modeling and mentoring:

- *"I learned how to work with, take care of and teach younger kids how to expand on their sailing, math and science skills by taking on the Junior Educator Internship." - Enmanuel Portes, NYC Museum School*

3. Deepen interest in math and science and increase ability to use scientific method and learned content to solve problems

- FM students' math and science grades were consistently higher than their peers'
- FM students' grades showed marginal improvement throughout the year while their peers' grades declined



- **82%** of students reported Agreement with the statement "...I have better problem solving skills" on the survey

Student testimonials about problem-solving:

- *“I got better math and science skills and I work in teams better” - Dymond Santos, Manhattan Business Academy*

4. Earn certifications from accrediting organizations to demonstrate growth in sailing skills

- **80%** of 35 students who took part in the course received a NASBLA (National Association of State Boating Law Administrators) Safe Boating Certification

5. Gain career awareness through internships and exposure to HRCS Member speakers

- **82%** of students reported agreement with the statement "...I know more about careers that interest me" on the survey
- **Monthly** career speakers from a variety of careers
- **50%** of students enrolled in HRCS internships

Student testimonials about career awareness:

- *“I learned about the different types of colleges that there are and different career choices.” - Ibis Banda, NYC Museum School*

6. Receive support for the college application process

“I can see our students writing their college essays about their experience at HRCS.”

- Camille Kinlock, Coordinator of Student Activities, The Legacy School for Integrated Studies

- **100%** of student opened Big Future accounts on College Board
- **68%** of students reported agreement with the statement "...I feel more prepared to apply to college" on the survey
- **62%** of students reported agreement with the statement "...I feel more prepared to choose a college" on the survey

Student testimonials about college preparedness:

- *“I learned about the different types of colleges and universities and the difference between a college and a university” - Argentina Maria-Vanderhorst, NYC Museum School*

7. Gain a deeper awareness, appreciation, and responsibility for their local environment and ecosystems.

Student testimonials about stewardship and ecology:

- *"I learned about the Pacific Ocean Garbage patch and how it impacted the ocean." - Bai Hao Yu, NYC Lab School for Collaborative Studies*
- *"I enjoyed learning about the oysters and their impact on NY Harbor" - Evelyn Vivar, NYC Museum School*

Appendices

Appendix A - Staff and Volunteers

Staff	**Volunteers**
Jerry Tullo – Sail Academy Program Coordinator Andrew Zuber- First Mates Program Coordinator Mwenye Seville - Leadership Coordinator Charlotte Matthews - Educator Jim Moore - Educator Alexe Taylor - Educator Maeve Gately - Educator Don Rotzien- Program Development and Growth Officer Chris Green- Operations Director	Nicholas Badal - Freelance Engineer Thomas Mueller - Musician & Computer Programmer Ian Wheeler - Entertainment Entrepreneur Diana Asatryan - Freelance Journalist Will Gilmore - Freelance engineer Michele Lopez - BMCC social work student Rocky Regan - HS for Math, Science, and Engineering student Marleney Polanco - BMCC Social Work Student Ashley Smith - BMCC Social Work Student Rupert Murray - Salesperson Rachel Fein - Engineering teacher Mark Horowitz - Dentist David Cripton - Videographer Kristen Pappas - Evaluation Manager Phoebe Law - Student Steven Fisher - Boat builder

Appendix B - Data

Attendance

Sail Academy	**Fall**	**Winter**	**Spring**	**Overall**
Program Hours	36	40	32	**108**
Attendance (%)	87%	83%	86%	**85%**
Enrollment	62	65	55	**92 Students Served Over the Year**[2]

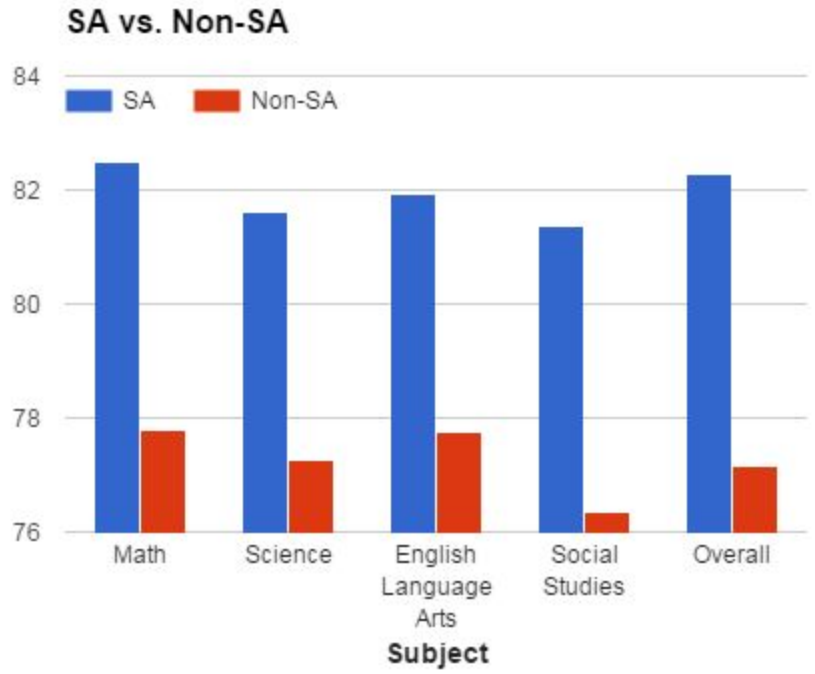
[2] This number accounts for the total number of students in the program over the course of the year. As some students leave at the end of one semester, and others come at the start of the next, the overall number is higher than those of each separate term.

First Mates	Fall	Winter	Spring	Overall
Program Hours	33	39	24	**96**
Attendance (%)	70%	71%	74%	**72%**
Enrollment	43	37	38	**50 Students Served Over the Year**[3]

Student Grades

The grades for Math, Science, English Language Arts, and Social Studies and Overall have been averaged from the total cohort of students and are on a NYC Department of Education 0-100 scale with 100 being the highest. A comparison in grades has also been drawn between students in the program and similar students not in the program using a sample of 45 students representing all 8 partner schools who were accepted into the program but either did not start the program or who dropped out after just one session (by their own choice). Data on students in the program is notated by “SA” for “Sail Academy” and “FM” for “First Mates” and data on students not in the program is notated by “Non-SA” for “Non-Sail Academy” and “Non-FM” for “Non-First Mates”.

Graph G1



Graph G2

[3] This number accounts for the total number of students in the program over the course of the year. As some students leave at the end of one semester, and others come at the start of the next, the overall number is higher than those of each separate term.

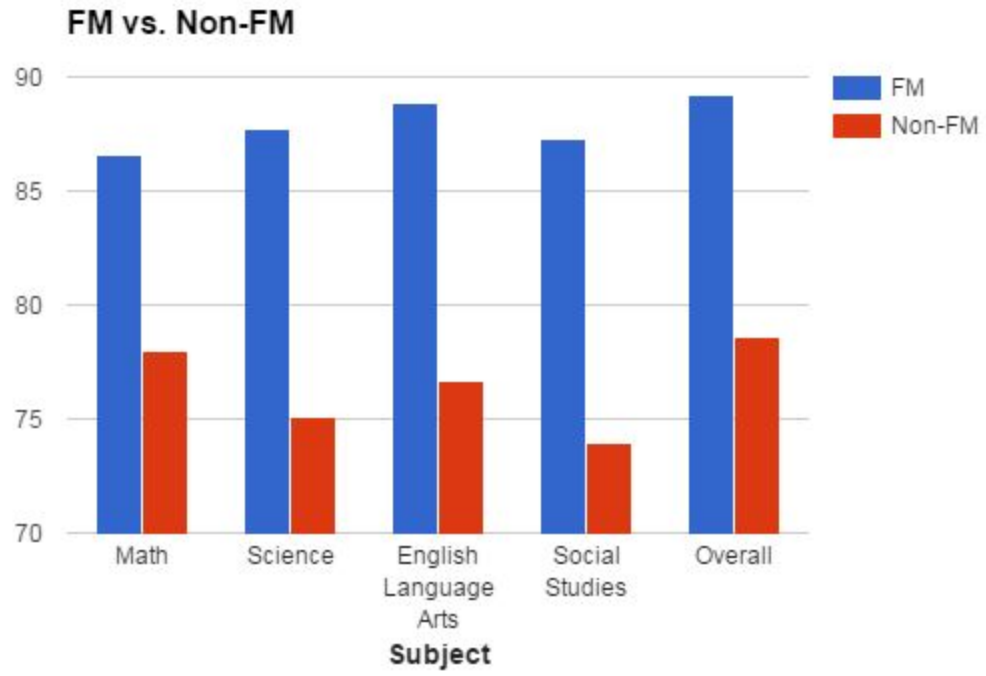


Table G1 - SA vs. Non-SA, FM vs. Non-FM

	Math	Science	English Language Arts	Social Studies	Overall
SA	82.49	81.62	81.92	81.38	82.29
Non-SA	77.79	77.26	77.76	76.34	77.16
	Math	Science	English Language Arts	Social Studies	Overall
FM	86.59	87.72	88.83	87.29	89.24
Non-FM	77.97	75.1	76.66	73.98	78.63

Overall = All subjects averaged

Diagnostic Tests

At the beginning of the program, students were administered a Math pre-test with questions generally covering the skills learned in the 9th grade. At the end of the program, students were administered the same exam as a post-test. The students' average results as well as the change in results from Pre- to Post-Test are recorded below.

Pre-Test Average	Post-Test Average	Change
34%	61%	**27%**

Surveys

Students were asked to reflect on the following questions as part of a survey administered three times during the program. The number in parentheses next to each statement correlates to the outcome it is measuring. Points were assigned for each response with "Strongly Agree" given a "5" down to "Strongly Disagree" given a

“1”. The number below represents the percentage of students in agreement (answering either “4” - “Agree” or “5” - “Strongly Agree”) with the statement for that survey (fall, winter or spring). “Max” refers to the percentage of agreement (“4” or “5”) for students highest score of the three surveys (Fall, Winter, Spring). “Avg” is the percentage of agreement of the average score of the three surveys (fall, winter or spring).

SA - Percent Agreement (Agree or Strongly Agree)					
Question	Fall	Winter	Spring	**Max**	**Avg**
Q1 - “..am more confident” (2)	55%	56%	63%	**70%**	**68%**
Q2 - “...have improved my math or science skills” (1)	39%	50%	45%	**55%**	**52%**
Q3 - “...am more interested in math or science” (3)	39%	44%	35%	**53%**	**50%**
Q4 - “...can solve problems better” (4)	39%	50%	47%	**65%**	**64%**
Q5..."make up my mind by gathering information rather than assuming what someone says is true" (4).	65%	61%	65%	**77%**	**74%**
Q6..."am more willing to take on new challenges" (2,5).	77%	61%	84%	**83%**	**80%**
Q7 - “...work in a team better”(2)	65%	69%	80%	**85%**	**83%**
Q9 - “...am a stronger leader”(2)	52%	46%	57%	**64%**	**64%**
Q10 - “...am enjoying learning new things”(3)	81%	89%	80%	**92%**	**92%**
Q11..."can reflect on each day using my journal" (6).	71%	54%	59%	**70%**	**64%**
Q12 - “...have a greater awareness of college and career possibilities”(7)	58%	65%	63%	**80%**	**74%**

FM - Percent Agreement (Agree or Strongly Agree)					
Question	Fall	Winter	Spring	**Max**	**Avg**
Q1 - "...I feel like a better role model to those younger than me in the program" (2)	78%	57%	82%	**82%**	**91%**
Q2 - "...I am a better sailor" (4)	91%	83%	81%	**94%**	**91%**
Q3 - "...My racing skills have improved" (4)	41%	56%	38%	**50%**	**50%**
Q4 - "... I like science more" (3)	50%	33%	29%	**50%**	**50%**
Q5 - "...I have stronger teaching skills" (2)	77%	67%	52%	**74%**	**71%**
Q6 - "...I have better problem solving skills" (3)	64%	78%	62%	**82%**	**79%**
Q7 - "...My cruising skills have improved" (4)	68%	83%	86%	**79%**	**79%**
Q8 - "...I feel more prepared to apply to college" (6)	55%	61%	48%	**68%**	**68%**
Q9 - "...I am a better student in school" (1)	50%	44%	38%	**59%**	**59%**
Q10 - "...I know more about careers that interest me" (5)	64%	78%	62%	**82%**	**79%**
Q11 - "...I like math more" (3)	36%	39%	29%	**41%**	**41%**

Q12 - "...I feel more prepared to choose a college" (6)	50%	61%	29%	**62%**	**59%**

Appendix C - Program Analysis

<u>Successes</u>

Student Captain Role Modeling
We made a major push to sail as much as possible this fall to keep the kids excited and dedicated to the program. Punctuating this was the certification of our first in-program student captain, Noa Yoder. During our two major sailing excursions, the fall expedition and city island transit, Noa captained her own boat of students (with adult supervision for the transit). This really encouraged the students to stay focused on improving their sailing so they to can sail one of our boats on their own one day.

Alumni/College
After a successful alumni event, welcoming back our first round of graduating seniors to come share their knowledge and wisdom to our underclassmen, we now look forward again to our second class of seniors preparing for their next steps. We will once again have all three of our seniors going on to college, most notably Noa Yoder got accepted Early Action to MIT.

Boatbuilding
Boatbuilding in First Mates has differed this winter than in years past, with greater staff investment in initial volunteer and student training sessions, and the introduction of a skills project in the form of folding chairs. This has worked well for new First Mates to be brought up to speed on the tool skills necessary to keep the Windmill a high caliber project.

Certifications
One of our newer goals has finally been accomplished for the first time. We have discussed incorporating sailing and boating certifications to First Mates in the past, and this fall, hosted an instructor to certify students in Safe Boating. In November, students participated in two classroom sessions to earn them certification as New York State Safe Boaters. Thirty students signed up for the course, with twenty-four successfully completing the exam and earning their certification. This is the first in a series of certifications we hope to offer the students including, the Basic Keelboat certification from US Sailing as well as certifying students to become HRCS Captains.

Attendance and Punctuality
One of the great successes of this year in Sail Academy is the way in which we set our standards of attendance and punctuality high early on. From the beginning, students were made aware that attendance needed to be consistent with students responsible for showing up every week in order to receive full academic credit. We explained the system for tracking absences, and the various ways that students could make up for absences. From the beginning, students understood that even if they were sick, or had to miss program on their usual day due to some unforeseen conflict, they would still be required to make up that day by either showing up on a different day that same week, or by coming to periodically scheduled make-up days. The creation of periodic “make-up days” allowed students to catch up on attendance and review the material they might have missed. This also provided an opportunity for students who normally come on different days of the week to get to know each other, and fostered a stronger social/emotional connection to the program at large.

Along these same lines, there was the creation of a system for cataloguing lateness that when accumulated counted as absencwe creat “make-up days”. The new system required that students who showed up more than 15 minutes late 3 times must come to a make-up day. This eliminated lateness almost entirely. Previously there were a handful of students who would arrive upwards of 30 minutes late, throwing a wrench into the gears of the program and slowing the progress of the rest of the group. Now there is only the occasional accidental lateness.

This year the “call-em all” technology we adopted allowed us to send pre-recorded messages to the parents regarding student absence. This frees up immense amounts of time for the program coordinator, which can be spent on more in-depth conversations with parents, or creating new material and lessons for the students.

New Recruits in December

Another success was the recruiting of 18 new students to Sail Academy from Quest to Learn and Harvest. These new students joined us for the beginning of the winter trimester and have essentially filled the space that was created by student attrition.

On the Water Early Fall

It is fundamental that the students get out on the water and begin to form positive associations with the sailing experience. After all, it is the passion for sailing that inspires students to learn the math, science and boatbuilding that Sail Academy provides. Due to a high volume of volunteers and staff, we were able to get all students on the water multiple times during the initial weeks when the sunsets were late enough to provide ample time on the water in warm temperatures.

We also had a record number of students attend our Trip Day, which is critical to facilitating the passion for Sail Academy. Trip Day is one of those rare instances where students get to spend long hours on the water and actually travel to a destination, rather than remaining within proximity to the boathouse. Students begin by setting destinations, plotting charts, and completing float plans. We have also begun to discuss provisioning and plan out lunches. This was a great exercise in both nutrition as well as responsibility. Students seized this rare chance to see the Statue of Liberty up close from a quiet sailboat, tour the New York Harbor and learn about its history, and visit a bird-sanctuary. This experience is invaluable when it comes to instilling a passion for sailing and education all at once, and will continue to be a part of the fall experience for years to come.

Curriculum Adjustment: Focus on Math

Another area of success was the modification of our curriculum. Whereas in previous years students received Math, Science and PE credit for participating in the program, this year we gave only Math and PE credit, reserving the Science credit for students who continue with First Mates the following year. This allowed Sail Academy to hone in on the Math of Sailing and Boatbuilding. This enabled us to ensure that our students have a solid foundation in 9th grade Math, which studies have shown is an important predictor of college readiness..

With more focus and time to spend on our Math of Sailing curriculum, our program coordinator was able to perfect and expand on existing lesson plans by including more hands-on activities, and refining our “best practices” with regards to those lesson and activities. The program coordinator was also able to create new lesson plans.

Best Practices with Existing Lesson Plans

One example included the usage of factory-made anemometers alongside student-made anemometers for higher accuracy of true wind readings. With regard to this lesson in particular, our program coordinator found that it was key to include a discussion of why *all anemometers* gave results much lower than the true

wind speed. These discussions included a list of confounding variables such as friction, mass, and acceleration. Students were then able to understand the discrepancy between their results and true wind-speed, as well as understanding the additional considerations calculated into a scientifically calibrated anemometer.

With regards to the chip-log lessons we found that students were better able to understand the process of calibration if it was broken up into two parts. The first part included the usage of the chip-log as a means of calculating the current speed from the dock. This first lesson allowed students to become comfortable operating the crank and using the stop-watches simultaneously. Later, when it came time to calibrate and tie knots, we used the 10 second count as a standard time-frame to calibrate to. This made sure that when all was said and done, a student could pick up any chip-log, and regardless of who calibrated it, they would know to use a ten second count.

New Curriculum Implemented:
Introducing Hullspeed Formula

There was a novel lesson on how to calculate boat-speed based on the length of the water line. This was great as it required an understanding of displacement, transition, and planning mode, as well as some fundamentals of frequency and wavelengths. Students were then able to calculate the top speed of various types of vessels and determine how quickly different types of boats could travel.

Introducing Compass Scavenger Hunt

The compass scavenger hunt was a great success. First the students were taught the basics of the compass, and how to handle it properly. Next they were asked to apply these skills to follow compass headings to find a series of hidden post-it-notes within the boathouse which eventually led to a box of candy. Each post-it-note had a compass heading (ie: 45 degrees NE) they could follow to find the next

Better Journaling Practices

Another success has been the consistent use of high quality notebooks or “journals”. Journaling is a critical part of the learning process whereby students reflect on the days activities and are better able to remember what they have learned. These journals also serve as their notebooks for data-recording, mathematical problem solving and note-taking. Making sure that every student has a durable journal that will last the year sends a strong message to students that Sail Academy is a rigorous program. In previous years the journals were flimsier and of lower quality. By having hard-cover journals students are better able to take notes during outdoor experiments that necessitate writing without being seated at a desk or table. With more serious materials for journaling came an increased ability to treat journaling as a serious activity where students can learn to express themselves and the events of the day. The durability of the new journals will allow students to review their notes from this special program for years to come.

Smartphone Photo Updates

We have made the switch from digital cameras to the instructors’ smartphone cameras. This allows a more seamless process of uploading photos to our online media relations, whether through Facebook or Instagram.

<u>Challenges</u>
Student Attendance

An ongoing challenge is the spotty attendance of some students. There are a handful of students who show up infrequently and therefore do not get the full experience of knowledge building in a linear fashion. The knowledge they do receive is not consistently reinforced, and therefore they are unlikely to benefit fully from the education. Also these students have not created the same bonds with other students in the program and

therefore are more likely to lose interest in the long run, which creates a snowball effect whereby poor attendance early on begets more infrequent attendance and eventually attrition. It's a shame because it takes up space in the program that could be made available for other students who might show a deeper commitment to the program.

Potential Solution: Next year we might want to have more students come to tryouts which would allow us to be more selective with who gets recruited.

For First Mates, when the weather turns colder, attendance decreases. This can be attributed to various factors. The walk to the boathouse, although not terribly far, becomes a chore in the cold and snow of winter, combined with minimal heating of the boathouse can be less than comfortable. Another obstacle to attendance is what we like to call "buy in." Since this is a transition year between offering Math, Science, and Physical Education credit all in Sail Academy and moving the Science credit to First Mates, there is only optional Physical Education credit. This makes the students' investment in the program less than when they can feel a more tangible academic benefit. Adding the Science credit to the program next year should help with the students continued commitment. Finally yet another management transition, although smoother than previous changes, does create some disruption in the continuity of the program and that culture can affect students participation.

Student Participation

Another challenge is the inability to get certain students involved, especially with regard to quantitative aspects. There is no regular homework in the program, so attendance, participation and enthusiasm are the main commitments that students are required to make. Attendance is simple enough to quantify, and students are held to a rigorous attendance requirement. However, some students have perfect attendance, but consistently drag their feet, fully aware that there is not much in place to quantitatively measure their participation and enthusiasm. These students probably think they will receive full credit for the program, despite a consistently lower level of participation than the rest. To combat this attitude we have told the students that there are two requirements to receive credit for the program. The first is attendance, and the second is a passing participation grade. This allows us to take students aside when they are unwilling to participate and explain that their behavior will need to improve in order to get a passing participation grade. However, the reality is that participation is hard to quantify, and no pre-existing rubric exists in our program. Perhaps with a more formal system for measuring and tracking students' participation grades, we would be able to better incentivize participation.

Potential Solution: Next year there should be a system in place to grade students on their participation at the end of each day. If 0-100% participation grade was given to each student at the end of each day this would allow us to quantify the commitment students are demonstrating over time.

Partial Credit

Dealing with the concept of partial credit is a challenge. Due to the incorporation of a new partner school, we have taken on some students at the beginning of the winter trimester. We are very glad to have these students in the program, but they should not get the same academic credit as the full-year students. They deserve credit for their commitment, but the degree and type of credit these students will receive is still in question. The resolution of this challenge will have to involve school administrators and be particular to each school credit system.

Usage and Allocation of Space

Our space within the school is a challenge. There seems to be a new policy at whereby the balcony may not be shared with a theatre group on-stage. It makes perfect sense, as the theatre groups need quiet and our saws are loud. We have gotten around this so far by setting up our shop in the halls of the school on the second floor. We usually set up four "work-benches" at the far end of the hall. This involves some transportation of work tools to and from the balcony, but is ultimately better because we can see all of the students at once, and do not receive noise complaints. Moving forward it would be ideal for there to be a concrete decision as to which spaces could be used for boat building and at which times. It would be nice to know where to set our things down each day without worrying about stepping on the toes of teachers or other theatre groups.

Potential Solution: Discuss reservation of the theatre balcony for next year ASAP. Also request to have a regular room schedule that can be relied upon as a gathering place for students and staff.

Disruptive Behavior

One final challenge is the management of disruptive behavior in the program. When students are disruptive in program it can be for any number of reasons. Understanding how to take these students aside and have conversations with them about their behavior without slowing the momentum of a group activity is always a challenge. If there are enough poorly behaved students in a day, it can be hard to follow up with all of the students during the time allotted. Disruptive and disobedient behavior also sets a bad example for other students and causes the standards of behavioral norms to drop.

Solution: Have one instructor who is designated to lead each lesson, and a second instructor ready to provide focused attention to students struggling with material or off-task behavior.

Differential in Student Ability

In school, students are separated by level of mathematical skill into different classes tailored toward the ability of those learners. At HRCS, students pick which day they will attend program mostly based on their own schedules and what works best for them. The result is that we have students of very different abilities in Math and Science, all learning in the same class. Sometimes this is fine. Other times, the result is that some students are struggling and need more clarification while other students are getting bored of a slower pace.

Potential Solution: Have handouts that contain "Mild, Medium, and Spicy" mathematics problems to provide continued challenges for students who are mastering material.

Refining the Math Content

Right now the idea behind the math curriculum is that it "generally follows the math students are using in school as a supplement to their regular learning". Considering the disparity of mathematical talent within our student body, it would behoove us to focus on mathematics that are sailing-specific, practical, and not try to follow what is done in school. For example, two subjects we taught this year were compass headings, and chart plotting with latitude and longitude. Both of these subjects provide hands-on math lessons that are not taught in schools, and therefore all students (regardless of school performance) start off on a level playing field. Perhaps we should revise this philosophy toward our math curriculum to instead emphasize the idea of "inspiring students with the practical applications of Maritime Mathematics". This would allow us to focus more on developing our own curriculum of math as it applies practically to ourselves as sailors, rather than attempting to apply the standard math curriculum to a marine environment.

Appendix D - Sail Academy Recruitment Process

Step 1 - Initial Presentation of Program to Students - First 2 Weeks of School

These short presentations are given by program staff and feature a short video about the program as well as answering student questions. Presentations are given to either the entire grade or 25-30 student groups. Most schools group students by advisories (similar to “Home Room”) and these smaller presentations are usually 1-3 advisory groups. Interested students receive a postcard telling them about two options for interested student meetings. Students are reminded about the upcoming meetings via flyers in school and school announcements.

Step 2 - Interested Student Meetings - Two Afternoons in 3rd Week of School
These meetings are held at the school (one in each building - 17 St and 18 St) in the auditorium. The general idea of these meetings is to get students excited about the program enough to come to the first two weeks of tryouts as well as orient them to the boat house and how to get there. As students arrive at the meeting, they are assigned to an instructor who will do a quick introductory activity before walking over to the boat house. Along the way, instructors answer student questions and discuss the program. Once at the boathouse, instructors give a tour of the facility, go over a sample day, and talk more about the benefits of the program. At the end, students receive an application, which they start filling out, and a sheet telling them which tryout day to show up for the following two weeks as well as what to bring.

Step 3 - Tryouts - Next Two Weeks
The purpose of tryouts is to expose students to the program without too much commitment from the student or the program. Students show up on a given day (ie: Monday) for two weeks and get a sampling of what a regular program day is like. On one of the days they go out sailing and the other they are learning on land.

Step 4 - Students Notified - 2nd Week of Tryouts
Students are notified by program staff through phone, email, and text whether they have been accepted into the program or put on the waiting list. Staff base their decision on attendance and participation at tryouts, the application, a brief interview done during tryouts, and a student's level need. Need is determined by self-reported 8th-grade grades, experience in similar programs, participation in other after school programs. Accepted students begin program the following week.

Appendix E - Sail Academy Logics Model

Outcomes	**Activities**	**Assessments**
1. Increase proficiency in math as compared to peers cohort	● Measure speed using chip log ● Measure wind using anemometer ● Measure current	Change in grades in math from 8th to 9th grade and during 9th grade as compared to peers in school, HRCS diagnostic test results from beginning to end of year
2. Improve communication and teamwork skills	● Give directions as captain of boat ● Work as team to win races ● Lead small-group learning	Students complete two expeditions as part of a team, including trip planning, execution, and debrief. Students also

	● Students plan Fall, Spring trips ● Students read journals aloud to group	self-reflect on their growth and development through journal entries and a survey given three times throughout the program.
3. Foster a greater interest in mathematics	● Interesting and unique math career presentations ● Enjoy going fast, can measure speed, compete to see who is fastest ● Plan out exciting trips using speed and current measurement	Students reflect on this through daily journal entries as well as a survey given three times throughout the program
4. Foster fact-based and independent decision-making	● Determine how an anemometer measures wind speed ● Determine how a chip log measures boat speed ● Learning through dialogues and questioning rather than lectures	Students reflect for each unit on how they came to the answer/solution/conclusion and how well it worked as well as a survey given three times throughout the program
5. Develop confidence and competence operating sailboats	● Learn basic sailing skills in small teams ● Practice basic maneuvers such as tacking, gybing, heaving-to and crew-overboard recovery ● Navigate boat around basic course ● Plan a sailing expedition	Complete the Final Expedition Trip at the end of the program and present experience in program at Graduation. Students also self-reflect on their growth and development through journal entries and a survey given three times throughout the program. Compete in short, point-to-point races.
6. Increase literacy through experience recording and reflecting	● Guided and free-form daily reflections in journal ● Post-Trip reflections ● Present journal entries for select topics ● Review entries periodically to measure growth	Students will reflect on their experience and what they learned on a daily basis in a personal journal. Entries are shared with the group where appropriate.
7. Expose students to college and career options, particularly in disciplines that require math skills	● Career presentations from varied careers ● College presentations on varied level of colleges ● Career reflections	Students are exposed to 8-10 different careers through 12-15 career presentations throughout the program. Students also reflect on their potential college and career interests through daily journaling and a survey given three times throughout the program

Appendix F - Sail Academy Program Syllabi

The Math of Sailing Syllabus
Fall - Learning to Use the Tools of the Sailing Trade

Unit 1 - Measuring Wind Speed
Students design an anemometer using simple items and then measure the speed of the wind on land and on the boat by calculating the circumference of their anemometer, multiplying that distance by how many times the anemometer spun, and then dividing by the number of seconds it was spinning. Students compare the ideas of head wind, true wind, and apparent wind.

Unit 2 - Measuring Boat Speed
Students learn the history of the chip log and then test out the chip log on the water to measure their maximum speed, average speed, and angle relative to the wind that is fastest. Afterwards, students determine where the "knot" unit was derived using unit conversion.

Unit 3 - Measuring the Relative Wind Angle
Students build a hand-made device known as a Pelorus that can measure both relative and actual wind angle. Focus is given to angles in relation to a particular perspective: "85 degrees off the bow".

Unit 4 - Measuring the Current
Students determine the speed of the current from the dock or anchored vessel using a floating bottle attached to a string and a stopwatch and the formula Distance = Rate x Time. Students measure the changes in the current over the course of a day and compare it to a Tide Table.

Spring - Applications of the Tools of the Sailing Trade

Unit 1 - Sail Area and Perimeter
The students pretend they are out on the water with a certain amount of sail area in a certain amount of wind. The wind then increases and they must reduce their sail area so as to maintain a constant pressure on the sail and thus on their mainsheet. They can then calculate the percent change in the area and perimeter of the sail.

Unit 2 - Sailing in Current
Students calculate what angle they must sail from Manhattan in order to end up directly across the river in New Jersey, based on a certain boat speed and current speed which they have measured. Students learn basic trigonometry as well as compile measurements they have taken to solve a larger problem.

Unit 3 - Calculating the True Wind Speed and Heading
Using a chip log to determine their boat speed and thus their head wind, as well as an anemometer to determine the apparent wind speed, and a pelorus to calculate the relative apparent wind heading, the students can use the Law of Cosines to determine the true wind speed and heading.

Unit 4 - Measuring Course Made Good
Students use a compass to triangulate their various positions throughout a sail on a chart. Based on their course, the speed of the current, and the speed of their boat, they can determine their Course Made Good (the distance they are making towards their destination vs. the distance they are traveling over ground).

The Sport of Sailing Syllabus

Unit 1 - Safety

Students learn proper procedures for wearing a PFD, being on the dock, getting onto and off of a boat, and moving around the boat. Students complete a Crew Overboard drill, learn to use the engine, and practice operating the VHF radio.

Unit 2 - Rigging and Derigging

Students learn how to properly rig and derig the boat including rigging the mainsail, jib sail and preparing the engine.

Unit 3 - Basic Boat Handling and Sail Trim

Students learn the three basic rules of sail trim while learning heading up and bearing off, tacking and gybing, and the various points of sail. Students learn the basic terminology and the basic parts of the boat.

Unit 4 - Knots

Students learn the seven basic knots used in sailing.

Unit 5 - Anchoring/Heaving To

Students learn how to properly anchor the boat. Students learn how to properly execute a heave-to maneuver used in heavy weather.

Unit 6 - Advanced Boat Handling and Sail Trim

Students learn the more specific methods of tuning the sail as well as the finer points of boat handling.

End of Report