HRCS
HUDSON RIVER COMMUNITY SAILING

Sail Academy Program Report 2013-2014

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1. Program Background

Description

Sail Academy recruits 9th grade students who need support in math and science from 7 New York City public high schools and engages them in a year of academic after school programming using sailing and boat building as its mediums. The curriculum is based on the methodology of experiential, student-centered, discovery learning; math, science, and character-building are taught through concrete, hands-on situations in small groups led by positive, responsible educators.

Upon completion of each semester of the program, students may earn credit in school. The program generally follows the math and science students are learning in school and is used as a supplement to their regular classroom learning. During the school year, students meet once per week, Monday-Thursday, from 4-7pm and every other Friday from 4-7pm and on select school holidays/weekends.

The program is broken down into three semesters over the course of their freshman academic year.[1]

1. Fall - *The Math and Science Behind Sailing, Part I*
2. Winter - *Building Boats and Understanding the Waters We Sail*
3. Spring - *The Math and Science Behind Sailing, Part II*

A more detailed description of the units within each semester is available in **Appendix B**.

Following the Sail Academy year, students may apply to our level one internships called **Leadership Intensive,** which occurs during the summer and focuses on leadership training and job skills. We also invite all graduates to continue with our **First Mate** program upon returning to school that fall. First Mates provides youth development programming throughout their high school career. First Mates meet weekly, with staff providing academic and social supports delivered in conjunction with advanced sailing and boating building skills. Students progress is carefully monitored, and they make long lasting relationships with fellow sailors, instructors, mentors, and other staff at HRCS.

HRCS Youth Development Programs Overarching Goals

The five primary goals of all youth programs at HRCS are summarized by the acronym **CLASS**.

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

[1] Students who complete all three semesters can earn a physical education, math, and science credit (162 hours).

S - Stewardship

Sail Academy Outcomes

The outcomes for Sail Academy prepare students to succeed in high school and beyond.

1. Increase proficiency in math and science as compared to peer 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

For explanation of Activities and Assessments associated with each of these Outcomes, please see the Logics Model in the Appendix A.

Staff and Volunteers

Staff	Volunteers
Alex Baum - Program Director James Cart/Katama Martellucci - First Mate Program Manager Spencer Merlis - Educator and Membership Director Chris Green - Educator and Operations Director Christin Ripley - Educator Kelly Dunn - Educator Andreas Pejovic - Educator Charlotte Matthews - Educator Zak Martellucci - Educator Andrew Zuber - Educator Jerry Tullo - Educator Maeve Gately - Educator	Genarile Debarros - BMCC social work student Michele Lopez - BMCC social work student Rupert Murray - Lexus Nexis executive Rocky Regan - HS for Math, Science, and Engineering student Rachael Fein - Engineering teacher at Brooklyn Tech Will Gilmore - Freelance engineer Jean Olson - Nurse Jessica Miller - Freelance writer Patrick Orenstein - Riverdale HS student

Highlights

Fall Exhibition - 11/16/14
Students and families gathered on a gorgeous Fall Saturday to view students work and the HRCS facility. Families also got to learn about the exciting year ahead.

Fall Expedition to the Statue of Liberty, Caven Point Bird Sanctuary - 11/11/12
As the culmination of their studies in the Fall, the group took a day sail to the Statue of Liberty and Caven Point Bird Sanctuary. During the sail, they took wind, boat, and current speed observations as well as reflected about the trip in their journals. Upon reaching the Statue, the group anchored their boats, had lunch, and went ashore to explore the wild bird mating grounds. 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 the Manhattan within view.

Wooden Boat Launch - 5/3/14
Students spent the winter building nine-foot wooden Optimist Dinghies. On May 3rd, they launched and sailed them for the first time in front of a cheering crowd of families and supporters.

Final Expedition - 6/5/14

As a culmination of Sail Academy, students put their skills to the test, and went on a full-day sail down around NY Harbor. After touring the Harbor, students moored their vessels at the home of the River Project's Wet Lab. With the help of River Project staff and volunteers, students got a hands-on experience with Hudson River wildlife.

Culmination Ceremony - 6/20/14

On the evening of June 20th, students displayed samples of their work and were recognized for their achievements. Students presented on a topic of interest related to sailing, math, and science in a format of their choosing in a "science fair" setting. Parents, teachers, and HRCS supporters interacted with the presentations as well as asked the students follow-up questions. Students were then recognized for their achievements that year through a certificate and ceremonial rope bracelet. At the completion of the ceremony, the students raised their bracelet-laden arms and chanted in unison, "Explore. Dream. Discover." as the newly-

inaugurated program motto.

2. Enrollment and Demographic Data

Enrollment

Initially Matriculated (09/13)	Enrolled as of 11/20/13 (End of Fall)	Enrolled as of 03/22/14 (End of Winter)	Enrolled as of 06/20/14 (End of Spring)	Completed Sail Academy
76	70	68	66	66

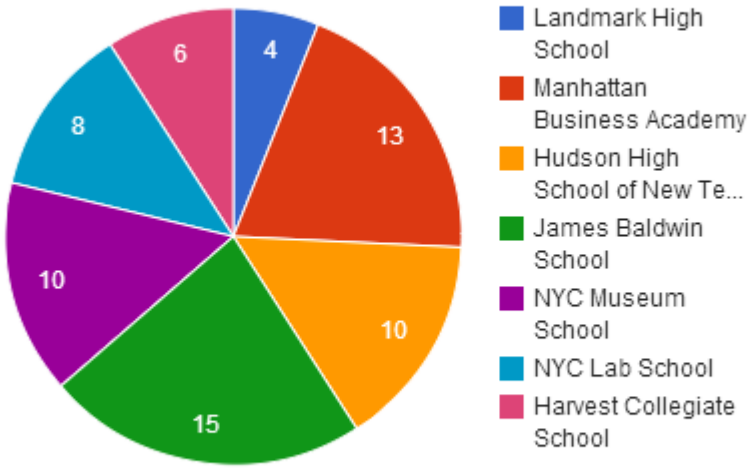
Hours

	Fall	**Winter**	**Spring**	**Overall**
Hours	48	60	54	162
Sessions	14 (13 @ 3 hr, 1 @ 9 hr)	20 @ 3 hr,	16 (15 @ 3 hr, 1 @ 9 hr)	50

Attendance

	Fall	**Winter**	**Spring**	**Overall**
2013-2014	**88%**	**76%**	**70%**	**77%**

Number of Students Completing the Program by Participating School



3. Assessments

Three assessments are used to evaluate student progress: Grades, Diagnostic Tests, Surveys, and Narrative Responses. **Grades** are collected in Math, Science, and Overall from four Marking Periods. We also use a control group of students, not enrolled in Sail Academy but otherwise similar, as a comparison. **Diagnostic Tests** are administered in Science and Math at the beginning and end of the program. **Surveys** ask students to self-report by quantitatively evaluating their improvement and are administered three times a year. Finally, students provide feedback on the program in the form of **Narrative responses** to various prompts.

Grades

The grades for math, science, 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 28 students representing all 7 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 data on students not in the program is notated by “Non-SA” for “Non-Sail Academy”.

Table 5a1	SA Math	Non-SA Math	SA Science	Non-SA Science	SA Overall[2]	Non-SA Overall[3]
Grade 9 November	84.62	76.65	78.86	74.47	81.93	77.1
Grade 9 January	83.12	76.36	80.82	76.63	83.35	78.64
Grade 9 March	83.86	74.78	83.6	72.5	85.04	75.91
Grade 9 June	82.6	77.5	84.24	73.4	85.12	77.45

Analysis: The data shows that students in Sail Academy generally score higher in Math, Science, and Overall (all subjects averaged) than students not in the program. Perhaps more significantly, Sail Academy grades increase from November to June (Science and Overall), whereas Non-Sail Academy grades decrease (Science) or have more moderate growth (Math and Overall). While we do not have the resources yet to fully validate these findings independently, we believe that student grades show a clear measure of the efficacy of the program. (See the Appendix for further grade analysis.) This year math improvement was disappointing, and less significant than in the previous two years. We are working to address that in some significant shift we will be making in 2014-15. (See changes for 2014-15).

Diagnostic Tests

At the beginning of the program, students were administered Science and Math Pre-Tests with questions generally covering the skills learned in the 9th grade in these subjects. At the end of the program, students were administered the same exams as Post-Tests. The students' average results as well as the change in results from Pre- to Post-Test are recorded below.

	Science Pre-Test Average	Science Post-Test Average	Change	Math Pre-Test Average	Math Post-Test Average	Change
2012-2013	20%	60%	**40%**	34%	56%	**22%**

Analysis: Students in the program showed an increase in their knowledge of and proficiency in Math and Science as demonstrated by their 40% (Science) and 22% (Math) increases in their Diagnostic Test scores from the beginning to the end of the program. While this data would be more conclusive as to the direct effect of the program on the students skills, rather than potentially just demonstrating their school-related (as opposed to program-related) increase in subject knowledge over the course of the year, by doing a similar comparison as above with a control group not in the program, the Diagnostic Test data, combined with the grade data above, does make a correlated argument in favor of the success of Outcome 1.

[2] All subjects averaged

[3] All subjects averaged

Surveys

Students were asked the 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. Student survey results were averaged for each question and each trimester. Points were assigned for each response with “Strongly Agree” given a “5” down to “Strongly Disagree” given a “1”. See the Appendix for the results of individual questions from specific semesters.

“Because of my experience in this program, I...”

Question	Fall	Winter	Spring
Q1 - “..am more confident” (2)	3.57	3.68	4.03
Q2 - “...have improved my math or science skills” (1)	3.42	3.41	3.68
Q3 - “...am more interested in math or science” (3)	3.46	3.34	3.37
Q4 - “...can solve problems better” (4)	3.5	3.58	3.74
Q5...make up my mind by gathering information rather than assuming what someone says is true (4).	3.94	3.81	4.16
Q6...am more willing to take on new challenges (2,5).	4.27	4.31	4.35
Q7 - “...work in a team better”(2)	4.04	3.81	4.16
Q9 - “...am a stronger leader”(2)	3.83	3.83	3.7
Q10 - “...am enjoying learning new things”(3)	4.54	4.15	4.19
Q11...can reflect on each day using my journal (6).	3.66	3.63	3.61
Q12 - “...have a greater awareness of college and career possiblities”(7)	3.48	3.63	3.61

Analysis: In general, most of the responses were in agreement (averaging a 3.5 or higher) or neutral (averaging a 2.5-3.5) towards all 12 questions. The responses also increased (ie Question 1) or stayed steady (ie Question 3) in their agreement with the statements as the program progressed. For Outcome-specific Analysis, see General Analysis below.

Narrative Responses

As part of the same survey described above, students were asked the following question in narrative response form. The purpose of this question was to allow students to assess their progress and the benefits of the program in more detail. For Testimonials from Principals and Teachers connected to the program, see Appendix E.

When asked, “What are the 2 most important things you got out of attending Sail Academy?”, students responded…

“This program has helped me be more responsible in school and helping my friends and I've been paying attention more in class than I was before” - Thierry Guimaraes

“I learned a lot about teamwork and patience. I also got a sense of leadership and gained some more skills in mathematics and science.” - Serena Tejnauth

“The two most important things I got out of this program was rigging up a boat. I never knew I had to do all these things before I actually started sailing, I thought you just put up the sail and go. Another thing that I learned was using the Eldrige book, I was able to find out when there is a high tide, low tide, and whether or not the water is ebbing or flooding” - Tasheena Stewart

“I always thought that sailing was easy and people who sailed as a career didn't do much. Sailing is not as easy as it seems but is fun none the less. I also learned how to work together with people even if you feel as though they won't comprehend the material: if you give them a chance to they may prove you wrong.” - Veronica Fernandez

“Two important things that i have got out of sail academy is that you need to be open minded to what others have to say and that you need to be able to work with your crew not just your friends but others too so that you know how to work with others and not just the people you like.” - Dawn Jones

“One of the most important things I got out of attending Sail Academy is to work together to solve challenging problems. Another thing I got out of attending Sail Academy is to choose what I want to do myself instead of depending on what people tell me to do so.” - Xue Fang Deng

“I learned the importance of teamwork. i learned how many problems can be solved if we work together. In contrast, if we work alone, these problems may not be solved as quickly or as good. Secondly, I learned how to use certain tools such as a drill and clamps. I am also now more comfortable using tools like saws than before.” - Christina Deng

“The two most important things that i got out of sailing academy were that now i understand so science concepts better because i have actually seen them in action. Another thing that i have got out of this progdsram is taking more chances to experience more things.” - Tynaise Williams

“The two most important things i got out of attending Sail Academy was being more brave. Im more open into to doing things that scare me. I also learned how to work in teams better. I do alot of team work here which helps alot.” - Dymond Santos

“One, I learned how to do multiple knots that I now use on a daily basis. Two, I learned that I am capable of being a leader. “ - Kelly Elugardo

“Experiencing sailing and its wonders. It is something that I will use later in life and a once in a lifetime experience. I also have a newfound respect for the ocean. Sailing is a lot harder than I thought it would be. There are hundreds of other things going on in the water, not just the waves.” - Mario Serrano

“I got to experience something new and met new people that go to a school in the same building as me that I probably never would have got the chance to meet them . “ - Cathy Richburg

4. General Program Analysis

Successes

In its second year of growth and expanded capacity, Sail Academy continues to succeed. In 2012-2013, the schedule was modified to allow double the number of students to take part, and this number was increased in 2013-2014 with creative use of staff and resources. The schedule was also modified on certain days to accommodate schools with alternative schedules.

A 7th school, Landmark High School re-joined the program as a partner school after a one-year hiatus following a tricky principal transition. Landmark’s student body almost universally qualifies for free/reduced lunch, and in general scores lower on standardized tests than its peers in Chelsea, It is a schools whose students need Sail Academy most. On the whole, Sail Academy recruited and kept students from this target demographic to a greater extent in 2013-2014 than in 2012-2013. This was due to a greater emphasis on this group during recruitment and greater focus on these students during the program.

The yearly schedule was simplified to include fewer but more focused outside-of-program events. This allowed staff, students, and families to focus their attention on making a smaller number of events better. The recruitment process was also simplified, improved, and shortened in order to reduce confusion and attract the highest number of students in the target demographic.

Improving students’ proficiency in math and science has long been one of the foremost goals of Sail Academy. This year, students grades were higher than their non-Sail Academy peers and showed growth. Students’ scores on the Diagnostic Tests also showed improvement. Based on the results of the Survey and Narrative Responses, the students themselves also see growth in their skills.

In addition to students improving their proficiency in math and science, we believe that if students find these subjects interesting that they will also perform better. The fundamental principle of Sail Academy is that sailing provides an interesting, hands-on “hook” to help students understand and thus succeed in math and science. Survey and Narrative Responses demonstrated that students are more interested in these important subjects as a result of the program.

Critical to success in college and the workplace, teamwork and communication are important goals of the program.

These skills are reinforced through small-group, objective-based activities such as rigging a boat, a short race, or building a wooden sailboat.

Being new to high school, as well as on the track towards college and career, it is important for students to begin thinking independently and critically. The ability to captain a boat and make safe decisions based on training and observations is an important skill that can be applied in a general sense throughout life. Especially for students struggling on a daily basis to avoid gangs, drugs, and general negative influences, it is critical, life-dependent even, for students to be able to think independently rather solely based on input from others. Based on the student survey responses, the students showed high and increasing agreement with the statements related to Outcome 4 (Question 4 and 5) dealing with fact-based and independent thinking.

In order to be able to teach students math and science through sailing, it is important that they have a basic understanding of the operation of a sailboat. Specific emphasis is given to these skills in the beginning of the Fall and, for review, the beginning of the Spring. Students' responses demonstrated, probably more clearly than any other outcome, that Outcome 5 was achieved. Within the survey, students were in almost unanimous agreement with Question 6 relating to Outcome 5. Question 6, relating to their willingness to take on new challenges, showed increases in agreement throughout the year to the highest score of all questions in the Spring.

As part of each program day as well as program trips, students recorded their experience in a personal journal based on a guided topic. More so than in past years, this became an important and well-ingrained part of each program day. Question 11 showed general agreement to students' ability to reflect using their journals.

Responses to Question 12 showed a general agreement with the statement regarding a greater awareness of college and career possibilities related to Outcome 7. Students were also exposed to new and different college and career options through semimonthly career speakers: friends of the program who were invited to share their college and career background. Speakers came from such varying careers as medicine, music, retail, sales, and non-profits.

Challenges

One of the biggest challenges in Sail Academy remains communicating effectively with students and their families outside of program time. A pilot group-text service was utilized, but needs more time and focus to become effective.

As a result of this, or possibly an independent issue, stduent/ parent/family attendance decreased this year as compared to last year. It will be important in the future to set up a calendar at the beginning of the year and reinforce it with students and parents/families throughout the year. Tone-setting and laying out clear expectations right from the beginning, even on the program application, will help to improve this.

While we had some staffing changes amongst our educators this year, the program was still able to develop a good sense of rapport with students and maintain a solid core. Over the course of the year, 12 different staff were involved with the program. In past years, this number was usually 4-5. With more effective planning and

longer term commitments from part-time staff, a consistency of instructors in 2014-15 will be occur.

Program Changes for 2014-2015

In order to continue to ensure that students improve their proficiency in math and science, and to provide a higher level of focus on each subject, moving forward Sail Academy will focus only on math, while the science content will be moved to the 10th grade year (1st year of First Mates). One area that this need became apparent was during the spring when instructors began building on the "Tools of the Trade" lessons taught in the fall. Students were struggling to understand basic concepts taught in the fall. Such a long hiatus from relevant math topics during the winter, when the content switches focus to science, is not conducive for increased understanding and improvement.

We are creating a more specific set of benchmarks and skill sets (math, sailing, leadership, etc) that are used and reinforced on a regular basis that all students must meet in order to complete Sail Academy.

In order to improve communication, the plan for next year is to improve our implementation of the group-text system. In addition, as part of their instruction, students will learn how to properly use email in order to facilitate even smoother communication.

In order to try and get ahead on the challenge of recruitment and the anticipated attrition during the first 3 weeks of Fall program, it has been decided to simplify the recruitment process and start of program to presentations, an orientation meeting for each school, and then a three-week "tryout" period where students would get a feel for the program and staff would get a feel for the students before making final decisions. With organization, this will cut down on overall program attrition and simplify the beginning of the program.

Based on data as well as the growing feeling that Sail Academy takes on too much, it has been decided to eliminate mandatory alternating Friday program due to the confusion and the scheduling challenge. This will also give staff a chance to catch up on administrative tasks and follow-up in a more targeted way with struggling students. Fridays will likely remain optional or as make-up days.

Appendices

Appendix A - Logics Model

Outcomes	Activities	Assessments
1. Increase proficiency in math and science as compared to peers cohort	● Measure speed using chip log ● Measure wind using anemometer ● Measure current ● Test water for temperature, pH, dissolved oxygen, nitrates/phosphates, coliform	Change in grades in math/science 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

	● Catch fish and crabs to understand food chain ● Study wastewater treatment process to understand human impact	
2. Improve communication and teamwork skills	● Give directions as captain of boat ● Work as team to win races ● Lead small-group learning ● Students plan Fall, Winter, Spring trips ● Students read journals aloud to group	Following the Final Expedition Trip at the end of the program, which students must complete as part of a team, students present their trip plans, gathered results, and identified conclusions to an audience of their peers, parents, and teachers. Students also self-reflect on their growth and development through journal entries and a survey given three times throughout the program (See Part 5c).
3. Foster a greater interest in mathematics and science	● Interesting and unique math and science career presentations ● Enjoy going fast, can measure speed, compete to see who is fastest ● Examine the river water, test to see whether clean or not ● 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 (See Part 5c).
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 (See Part 5c).
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 sailing expedition	Complete the Final Expedition Trip at the end of the program and present experience. Students also self-reflect on their growth and development through journal entries and a survey given three times throughout the program (See Part 5c). Compete in short, point-to-point races.
6. Increase literacy through experience recording and	● Guided and free-form daily reflections in journal	Students will reflect on their experience and what they learned

reflecting	● Post-Trip reflections ● Present journal entries for select topics ● Review entries periodically to measure growth	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 and science 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 (see Part 5c).

Appendix B - 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 degress 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 Science Behind Boat Building and Design Syllabus:
Unit 1 - The History of Sailboat Design - Students examine 3,000 years of sailboat technological innovation and compare what features worked well and thus survived and those that did not.

Unit 2 - How a Sailboat Works (Sails/Keel) - Students examine the lift force applied to the sails by wind and the counteracting lift force on the keel created by the water that “squeeze” the boat forward. Students use simple tests to prove the wind “pulls” the sail rather than pushing it.

Unit 3 - Buoyancy - Students examine the role of mass, volume, and density in buoyancy and the effect on buoyancy of changing one of these areas. Students make various sample vessels to test the relative buoyancy.

Unit 4 - Stability - Using a computer simulation, students test various configurations of weight amount and placement and determine their effect on a boats stability.

Unit 5 - Speed - Students examine different factors such as hull shape, weight, and length, as well as sail area and shape that impace a boats speed.

Unit 6 - Measurement Using a 1/16” Ruler and T-Square - Students review adding, subtracting, multiplying and reducing fractions in order to better use the 1/16” ruler for exact measurements. Students also practice drawing perpendicular lines using a T-Square.

Unit 7 - Reading a Technical Diagram - Students dissect a two-dimensional drawing and break it down into manageable steps for turning it into a three-dimensional shape.

Unit 8 - Basic Tool Identification and Use - Students discuss the name and different, safe uses for a tool and then use them to construct a nine-foot wooden sailboat.

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 main sail, 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.

Appendix C - Further Grade Analysis

The table below (5a2) shows the change in score from semester to semester, ie. from November to January, the SA Math score decreased 1.5 from 84.62 to 83.12. Negative numbers mean a decrease in score.

Table 5a2	SA Math	Non-SA Math	SA Science	Non-SA Science	SA Overall[4]	Non-SA Overall[5]
Change Nov-Jan	-1.5	-.29	1.96	2.16	1.42	1.54
Change Jan-Mar	.74	-1.58	2.78	-4.13	1.69	-2.72
Change Mar-Jun	-1.26	2.72	.64	.9	.08	1.54

[4] All subjects averaged

[5] All subjects averaged

Overall (Nov-Jun)	-2.02	.85	5.38	-1.07	3.19	.35

The chart below (5a3) shows the difference in score for a given marking period between a student enrolled in Sail Academy and a student not enrolled in Sail Academy. Numbers in blue indicate when Sail Academy students scored higher than non-Sail Academy students. Scores in red show the opposite. For example, for the November marking period, Sail Academy students averaged 84.62 and non-Sail Academy students averaged 76.65 in math, a 7.97 point difference.

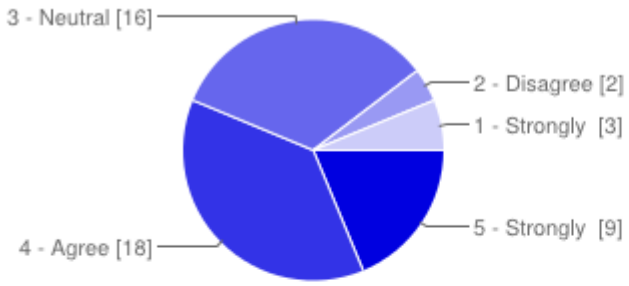
Table 5a3	Math	Science	Overall
Grade 9 November	7.97	4.39	4.83
Grade 9 January	6.76	4.19	4.71
Grade 9 March	9.08	11.1	9.13
Grade 9 June	5.1	10.84	7.67

Appendix D - Survey Results

“Because of my experience in this program, I...”

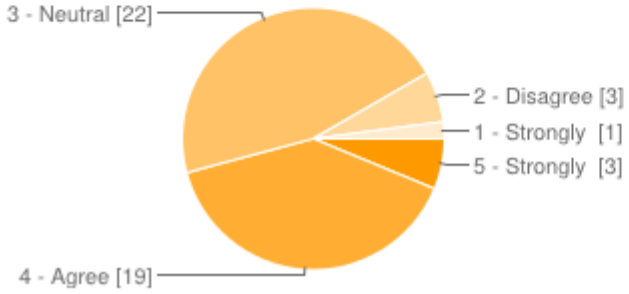
Fall

(1)....am more confident (2).



5 - Strongly Agree	9	19%
4 - Agree	18	38%
3 - Neutral	16	33%
2 - Disagree	2	4%
1 - Strongly Disagree	3	6%

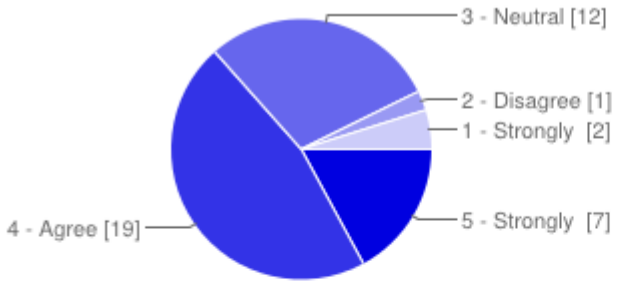
(2)...have improved my math or science skills (1).



5 - Strongly Agree	3	6%
4 - Agree	19	40%
3 - Neutral	22	46%
2 - Disagree	3	6%
1 - Strongly Disagree	1	2%

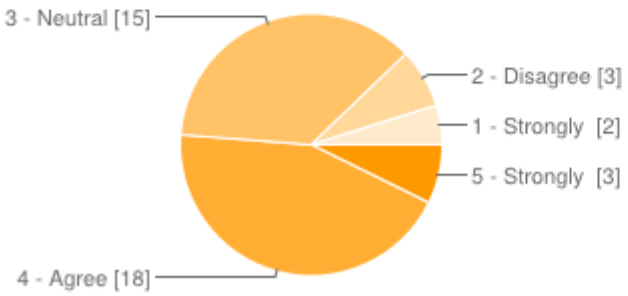
Winter

(1)....am more confident (2).



5 - Strongly Agree	7	17%
4 - Agree	19	46%
3 - Neutral	12	29%
2 - Disagree	1	2%
1 - Strongly Disagree	2	5%

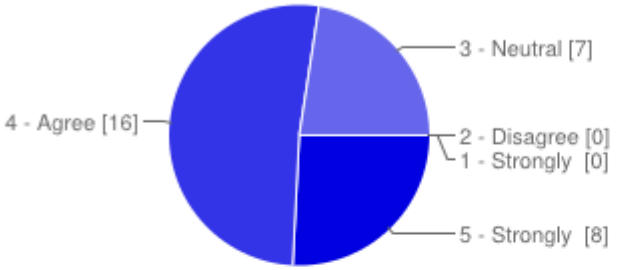
(2)...have improved my math or science skills (1).



5 - Strongly Agree	3	7%
4 - Agree	18	44%
3 - Neutral	15	37%
2 - Disagree	3	7%
1 - Strongly Disagree	2	5%

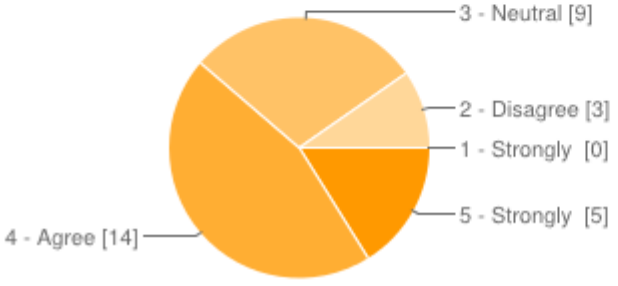
Spring

(1)....am more confident (2).



5 - Strongly Agree	8	26%
4 - Agree	16	52%
3 - Neutral	7	23%
2 - Disagree	0	0%
1 - Strongly Disagree	0	0%

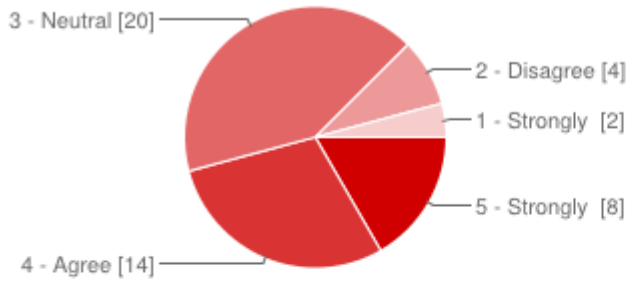
(2)...have improved my math or science skills (1).



5 - Strongly Agree	5	16%
4 - Agree	14	45%
3 - Neutral	9	29%
2 - Disagree	3	10%
1 - Strongly Disagree	0	0%

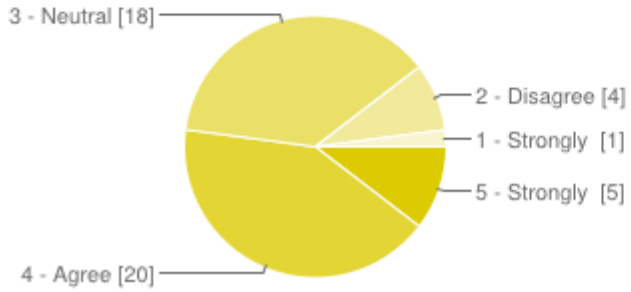
Fall

(3)...am more interested in math or science (3).



5 - Strongly Agree	8	17%
4 - Agree	14	29%
3 - Neutral	20	42%
2 - Disagree	4	8%
1 - Strongly Disagree	2	4%

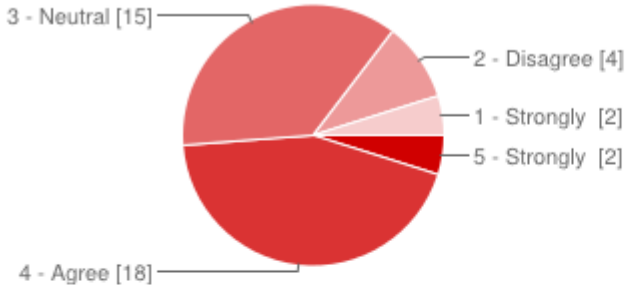
(4)...can solve problems better (5).



5 - Strongly Agree	5	10%
4 - Agree	20	42%
3 - Neutral	18	38%
2 - Disagree	4	8%
1 - Strongly Disagree	1	2%

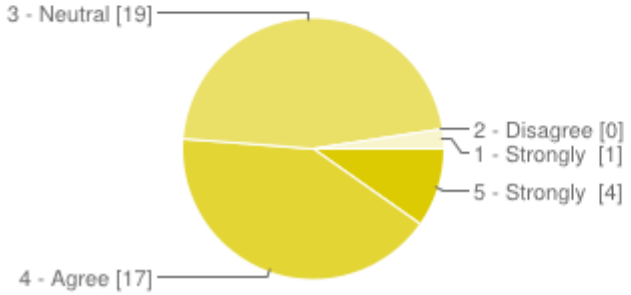
Winter

(3)...am more interested in math or science (3).



5 - Strongly Agree	2	5%
4 - Agree	18	44%
3 - Neutral	15	37%
2 - Disagree	4	10%
1 - Strongly Disagree	2	5%

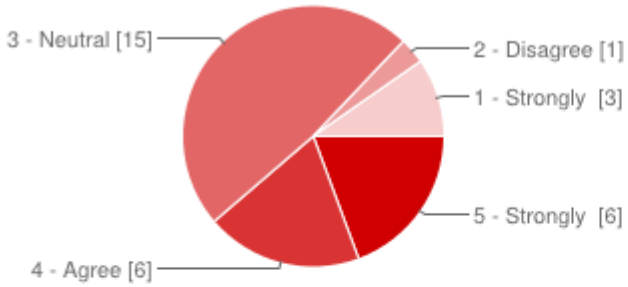
(4)...can solve problems better (5).



5 - Strongly Agree	4	10%
4 - Agree	17	41%
3 - Neutral	19	46%
2 - Disagree	0	0%
1 - Strongly Disagree	1	2%

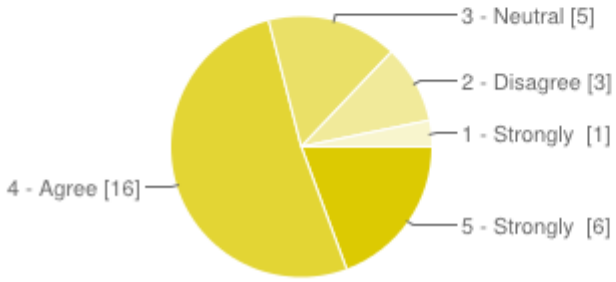
Spring

(3)...am more interested in math or science (3).



5 - Strongly Agree	6	19%
4 - Agree	6	19%
3 - Neutral	15	48%
2 - Disagree	1	3%
1 - Strongly Disagree	3	10%

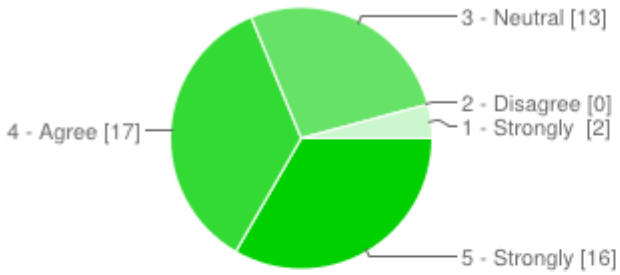
(4)...can solve problems better (5).



5 - Strongly Agree	6	19%
4 - Agree	16	52%
3 - Neutral	5	16%
2 - Disagree	3	10%
1 - Strongly Disagree	1	3%

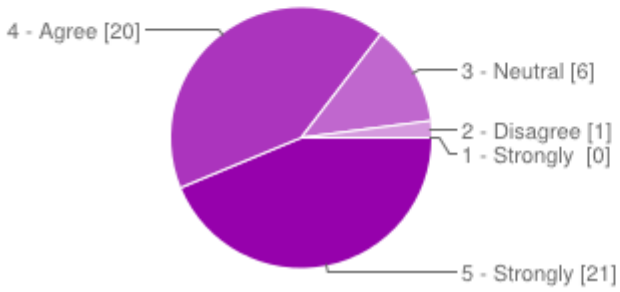
Fall

(5)...make up my mind by gathering information rather than assuming what someone says is true (4).



5 - Strongly Agree	16	33%
4 - Agree	17	35%
3 - Neutral	13	27%
2 - Disagree	0	0%
1 - Strongly Disagree	2	4%

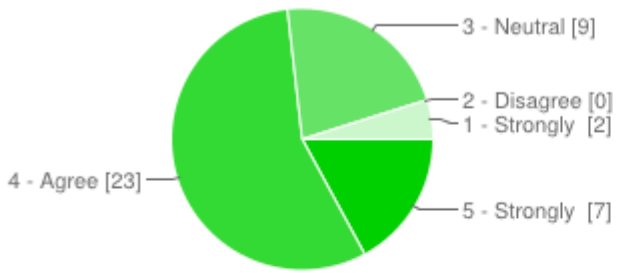
(6)...am more willing to take on new challenges (2,5).



5 - Strongly Agree	21	44%
4 - Agree	20	42%
3 - Neutral	6	13%
2 - Disagree	1	2%
1 - Strongly Disagree	0	0%

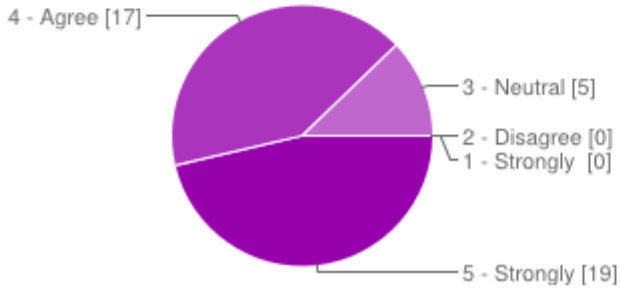
Winter

(5)...make up my mind by gathering information rather than assuming what someone says is true (4).



5 - Strongly Agree	7	17%
4 - Agree	23	56%
3 - Neutral	9	22%
2 - Disagree	0	0%
1 - Strongly Disagree	2	5%

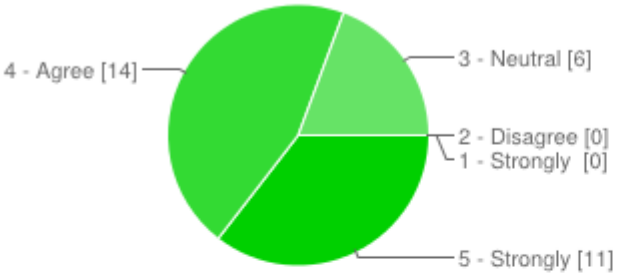
(6)...am more willing to take on new challenges (2,5).



5 - Strongly Agree	19	46%
4 - Agree	17	41%
3 - Neutral	5	12%
2 - Disagree	0	0%
1 - Strongly Disagree	0	0%

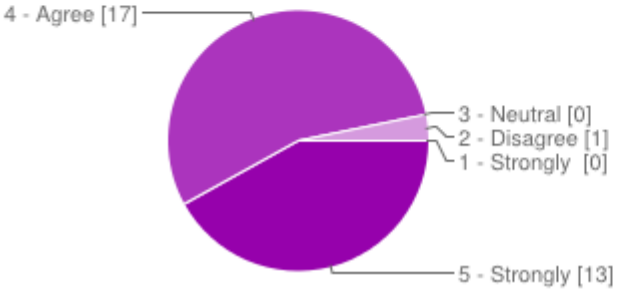
Spring

(5)...make up my mind by gathering information rather than assuming what someone says is true (4).



5 - Strongly Agree	11	35%
4 - Agree	14	45%
3 - Neutral	6	19%
2 - Disagree	0	0%
1 - Strongly Disagree	0	0%

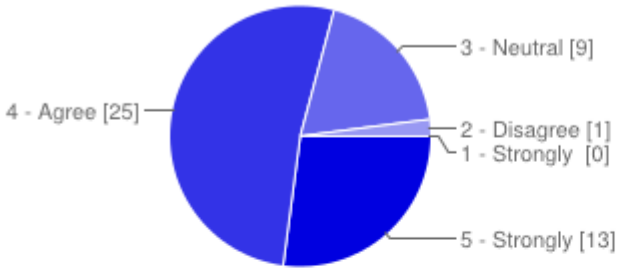
(6)...am more willing to take on new challenges (2,5).



5 - Strongly Agree	13	42%
4 - Agree	17	55%
3 - Neutral	0	0%
2 - Disagree	1	3%
1 - Strongly Disagree	0	0%

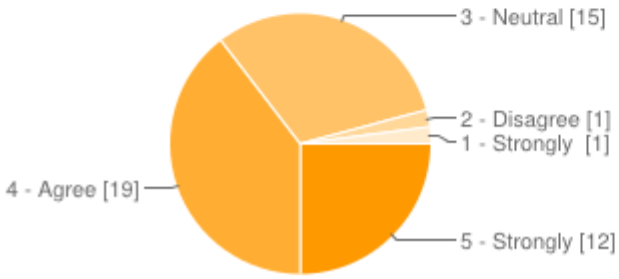
Fall

(7)...work in a team better (2).



5 - Strongly Agree	**13**	27%
4 - Agree	**25**	52%
3 - Neutral	**9**	19%
2 - Disagree	**1**	2%
1 - Strongly Disagree	**0**	0%

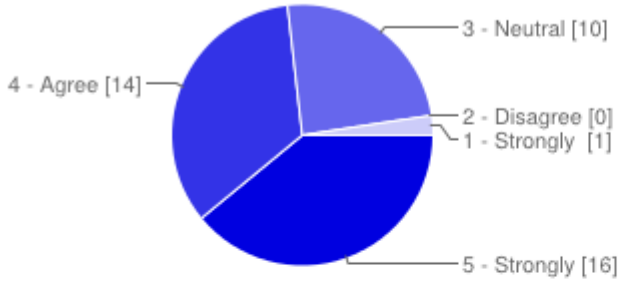
(9)...am a stronger leader (2).



5 - Strongly Agree	**12**	25%
4 - Agree	**19**	40%
3 - Neutral	**15**	31%
2 - Disagree	**1**	2%
1 - Strongly Disagree	**1**	2%

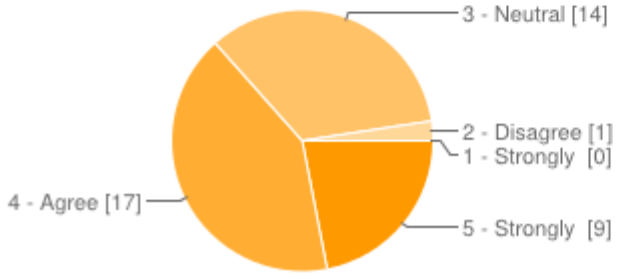
Winter

(7)...work in a team better (2).



5 - Strongly Agree	**16**	39%
4 - Agree	**14**	34%
3 - Neutral	**10**	24%
2 - Disagree	**0**	0%
1 - Strongly Disagree	**1**	2%

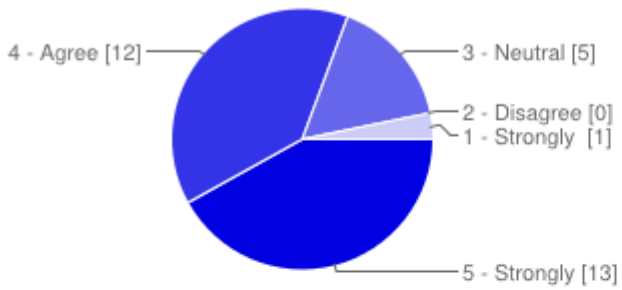
(9)...am a stronger leader (2).



5 - Strongly Agree	**9**	22%
4 - Agree	**17**	41%
3 - Neutral	**14**	34%
2 - Disagree	**1**	2%
1 - Strongly Disagree	**0**	0%

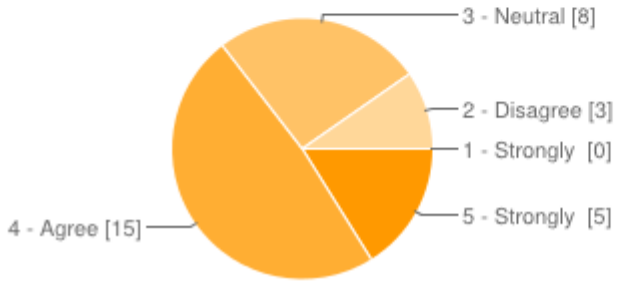
Spring

(7)...work in a team better (2).



5 - Strongly Agree	**13**	42%
4 - Agree	**12**	39%
3 - Neutral	**5**	16%
2 - Disagree	**0**	0%
1 - Strongly Disagree	**1**	3%

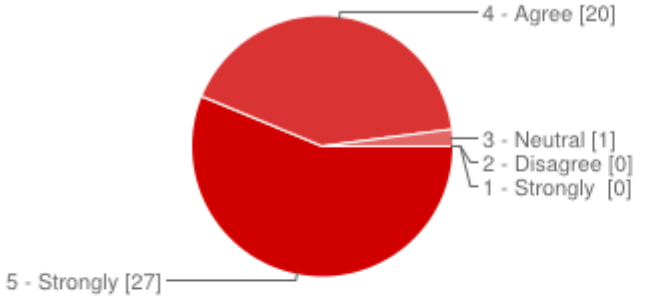
(9)...am a stronger leader (2).



5 - Strongly Agree	**5**	16%
4 - Agree	**15**	48%
3 - Neutral	**8**	26%
2 - Disagree	**3**	10%
1 - Strongly Disagree	**0**	0%

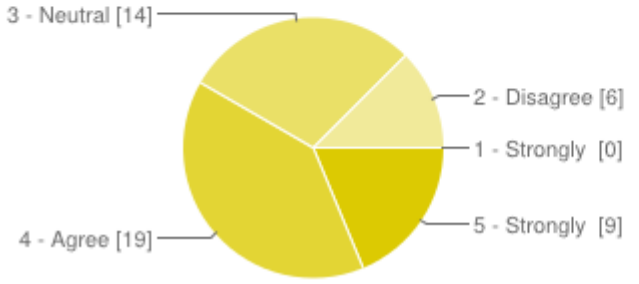
Fall

(10)...am enjoying learning new things (3).



5 - Strongly Agree	**27**	56%
4 - Agree	**20**	42%
3 - Neutral	**1**	2%
2 - Disagree	**0**	0%
1 - Strongly Disagree	**0**	0%

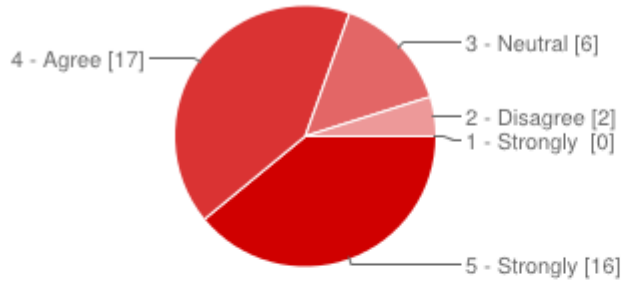
(11)...can reflect on each day using my journal (6).



5 - Strongly Agree	**9**	19%
4 - Agree	**19**	40%
3 - Neutral	**14**	29%
2 - Disagree	**6**	13%
1 - Strongly Disagree	**0**	0%

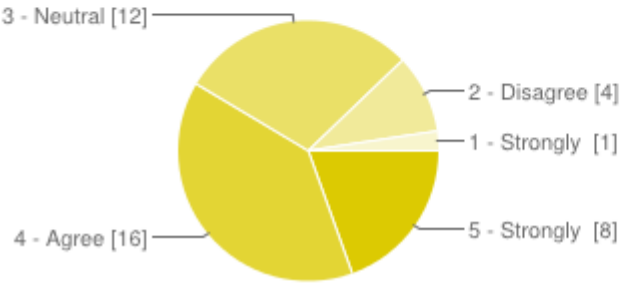
Winter

(10)...am enjoying learning new things (3).



5 - Strongly Agree	**16**	39%
4 - Agree	**17**	41%
3 - Neutral	**6**	15%
2 - Disagree	**2**	5%
1 - Strongly Disagree	**0**	0%

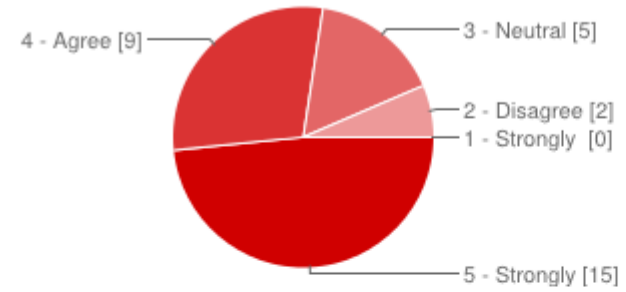
(11)...can reflect on each day using my journal (6).



5 - Strongly Agree	**8**	20%
4 - Agree	**16**	39%
3 - Neutral	**12**	29%
2 - Disagree	**4**	10%
1 - Strongly Disagree	**1**	2%

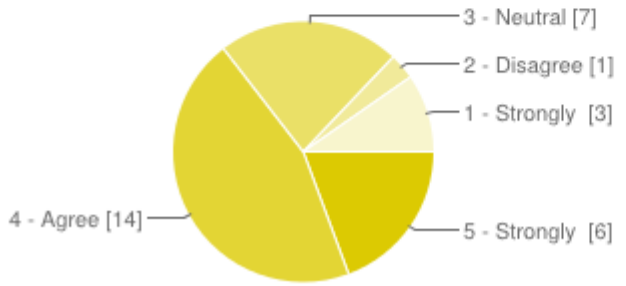
Spring

(10)...am enjoying learning new things (3).



5 - Strongly Agree	**15**	48%
4 - Agree	**9**	29%
3 - Neutral	**5**	16%
2 - Disagree	**2**	6%
1 - Strongly Disagree	**0**	0%

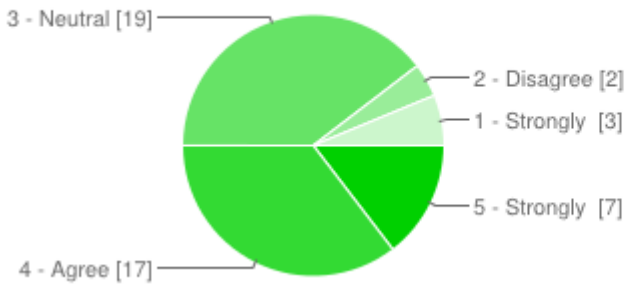
(11)...can reflect on each day using my journal (6).



5 - Strongly Agree	**6**	19%
4 - Agree	**14**	45%
3 - Neutral	**7**	23%
2 - Disagree	**1**	3%
1 - Strongly Disagree	**3**	10%

Fall

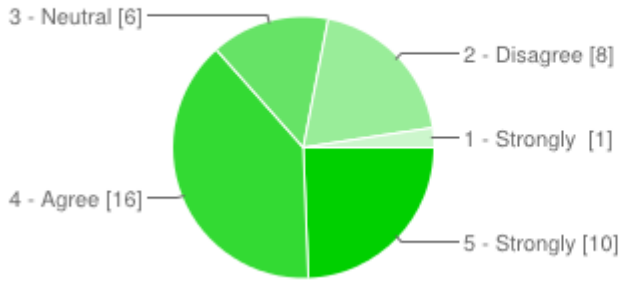
(12)...have a greater awareness of college and career possibilities (7).



5 - Strongly Agree	7	15%
4 - Agree	17	35%
3 - Neutral	19	40%
2 - Disagree	2	4%
1 - Strongly Disagree	3	6%

Winter

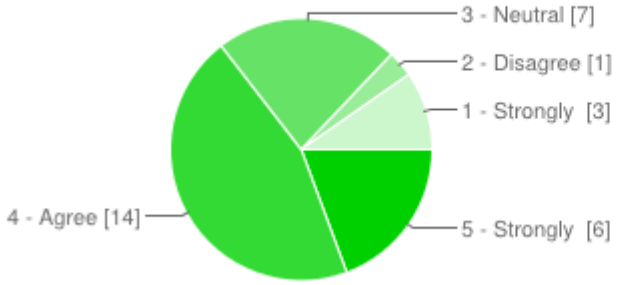
(12)...have a greater awareness of college and career possibilities (7).



5 - Strongly Agree	10	24%
4 - Agree	16	39%
3 - Neutral	6	15%
2 - Disagree	8	20%
1 - Strongly Disagree	1	2%

Spring

(12)...have a greater awareness of college and career possibilities (7).



5 - Strongly Agree	6	19%
4 - Agree	14	45%
3 - Neutral	7	23%
2 - Disagree	1	3%
1 - Strongly Disagree	3	10%

Appendix E - Principal/Teacher Testimonials

Principal/Teacher Testimonials

Dear Hudson River Community Sailing,

Please allow me to express gratitude on behalf of The James Baldwin School. I want to share with you the overwhelming positive feedback I have heard from the students who attended the class and the teachers that saw what a positive impact the course had on them. I also wanted to share my own reflections and thanks. Now that the program has ended, I have been able to reflect back and really identify how important it has been to every student that attended.

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. Three of the young ladies who completed the course just took the Integrated Algebra Regents. Not coincidently they were the three last students to hand in their tests. As I saw them struggling through difficult material without giving up on themselves, I couldn't help but think back to moments out on the boats.

The first of the three young ladies suffered from sea sickness multiple times throughout the semester, but kept coming back, surprising herself and raising the bar for the rest of the students. The second young lady often used the boat as a metaphorical way of escaping from a troubled home life. On one day things were so bad, that she couldn't keep from crying profusely as she rigged the sails. The striking part of the scene was the level of focus in her eyes that couldn't be obscured by the tears. It was the same focus that was present as she made sure that she answered every question on the exam, even the ones that left her confused.

By the end of the test there were four people left in the room, the proctor and the three students. The three young ladies were scattered throughout the room, surrounded by the desks formerly occupied by students who had finished or given up. This image reminded me of the reaction of the three girls when I told them that I was intentionally separating them so that they would each be on a different boat. They did not take the news well. For the next month, they developed a daily ritual of pleading to be put together and then trying to sneak onto each others boat when told no. However each day the argument was a little less emotional, and by the end of the first month they stopped asking at all. On the last day of class we asked students to speak about what the benefits of the course were. One of the three young ladies raised her hand and spoke about how the course taught her to work in groups and get along with others.

Let me close by reiterating the amazing nature of the unique experience that you offered our students. I hope that the partnership between our school and your program can continue indefinitely and that you are able to expand and offer a similar experience to as many New York City students as possible.

Thanks again,
John Schaefer, Math Teacher, The James Baldwin School

"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

"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

End of Report