STEAM Experiences: Standard 9 - STEAM Extensions

School/program provides within-school and extracurricular opportunities for students to extend STEM learning

Concept 1 - School/program provides a variety of STEM-specific extracurricular and extended day opportunities for all learners (clubs, competitions, summer camps).

Concept 2 - Students have multiple formal, age appropriate opportunities to engage with STEM practitioners, community experts, and/or other STEM partners.

At Fairhope West Elementary School we believe in offering students the chance to solve real-world problems using the design engineering process. And we strive to provide a plethora of STEM-specific learning opportunities to stimulate a lifelong love for learning in all students. We are able to reach a diverse group of children, of varied ages, genders, races, abilities, and backgrounds, through the clubs, classes, camps, coding, robotics, and media opportunities we offer.

During the 2019-20 school year third graders participated in 18 different clubs at our school (i.e. the school formerly known as Fairhope Elementary School). Students were able to discover their strengths and interests by participating in the club of their choosing. We had many STEAM-themed clubs like: Girls-in-Steam, Video Production, Robotics, Technology, Chess, and Friends-of-the-Earth clubs. Beginning in the fall of 2020 we will offer a variety of clubs to grades third through sixth, with possible clubs created for grades first and second in January 2021. As a Leader In Me school, we strive to give students a voice in their own learning. Student-driven learning is evident in the clubs we provide where students have a vote in determining the direction the club goes in.

For example, in the Friends-of-the-Earth club, students voted to focus the club's efforts on starting an anti-littering campaign at the school. Students in the club hung up anti-littering posters around the school that they designed, and began the process of writing and creating videos to promote reusables and discourage littering. In this club students are striving to solve the real-world problem of trash in the environment, particularly in our oceans and waterways.

In their homerooms and in our STEAM Lab, students regularly solve real-world problems, and explore the design engineering process, while using the 3 C's: collaborate, communicate, and create. From 2018 through early 2020 all kindergarten through third grade students, at FWES, received STEAM classes twice a month. Our STEAM instructor now focuses on collaborating and co-teaching with classroom, enrichment, and resource teachers. Additionally, the director of the Pelican's Nest meets

with teachers to help them to utilize Google Classroom to extend what students are learning at the Pelican's Nest and to bring real-life connections to their learning. Also, classroom teachers utilize STEAM lab resources, such as Kibo robots, throughout the school year to enhance instruction, teach in a cross-curricular way, and teach the design engineering process to students.

The Fairhope Educational Enrichment Fund (FEEF) has provided our students funding and access to robots. Robots, at our school, have been utilized in the STEAM lab, in regular classrooms, and by the robotics team. Diverse ages and student populations have had the opportunity to explore real-life problem-solving through the use of robots. During the 2019-20 school year our school's robotics team consisted of more than 50 % females, with a racial makeup of 10.75 percent African American, 1 percent hispanic, and 2 percent Asian out of a total of 43 students.

Our 2019-20 school robotics team, which was made up of two, third-grade classes was in its second year of participating in robotics competitions. Last school year, the team prepared to compete in the first-ever Baldwin county robotics competition titled: the "Master Robotics Competition with the theme being "Dashing through Old St. Stephens." Students prepared for the competition by completing challenges, within the classroom, that utilized the EDP. Using grid paper, students imagined and created a map of the Old St. Stephens' settlement, determined map measurements, then planned their code to complete the challenge. Finally, students tested and improved their code, working through any "bugs" to complete the challenge successfully. Unfortunately, they were unable to compete because schools were closed as a result of the pandemic.

Our school is incorporating coding into instruction more and more. Not only have all kindergarten through third grade students coded with Scratch Junior in the STEAM lab, but many classroom teachers are bringing coding into the regular classroom. All three of our Pre-K classes code using the Fisher Price Think and Learn Code-a-Pillar Twist, where students facilitate movements and actions through coding the Code-a-Pillar. In one kindergarten class, Kibo Robots were coded by students to facilitate movements and actions to simulate a Mardi Gras parade.

During the 2019-20 school year, many classroom teachers began incorporating coding into their teaching in pre-K through third grades. As of the week of December 7-11, 2020, we will have 100% student participation in coding as the school celebrates Computer Science Education Week.

In addition to coding skills, our students develop other real-life skills that prepare them to be 21st century learners. One such example is with FWES Live Morning News. In years past third grade students were selected to produce the news for our school announcements. Now that we are K-6 school, the children producing the news, at our school, are in grades fifth and sixth. It is the responsibility of the Morning News Crew to report the weather, announce the lunch menu, and broadcast news events for school while being video recorded. In addition, the Morning News Crew selects graphics,

chooses props, inputs information into the tele-prompter, runs the tele-prompter, interviews special guests, and brainstorms ideas of what to spotlight on the news.

On the Morning News Crew, boys and girls are represented equally. Currently we are striving to show a greater representation of children of color, children with disabilities, and those from low-income families. Additionally, we invite real local news people as guests on the WFES Live Morning News to expose our students to working professionals. We've had local meteorologist Alan Seals and news reporter Lenise Lignon, both people of color, on WFES Live to provide a strong example to all of our students.

Each year, all first grade students, at FWES, choose a profession to research and dress up as. Because we're a Leader in Me school it's important for our students to reflect on what they're interests are so that they can begin to think about setting educational goals to reach their dreams for the future. Each first grade class gets to hear presentations from professionals in our community speaking about their occupation. Every year, we have several guest speakers representing a variety of professions, some of which are STEM-oriented.

Additionally, our students have heard from our stakeholders in the sciences. We've had guest scientists from Dauphin Island Sea Lab, the Alabama Department of Wildlife and Fisheries, and other local environmental education organizations speak to our students. We'd like to build on these relationships, in the future, with organizations like, Leave Only Footprints, Alabama Coastal Foundation, and Dauphin Island Sea Lab's Discovery Hall to move in the direction of having our students communicate with scientists to solve real-world problems. Some examples of problems that our students may address in the future are decreasing Monarch butterfly populations, and plastic waste ending up in landfills and waterways.

We're proud to have a community of students, educators, parents, environmentalists, and local Fairhope residents who come together every year to participate in the Alabama Coastal Clean-up. Our school could lead the way in helping to keep litter out of the bay if we worked with local stakeholders on this issue, year-round, to promote resusables, clean up our beaches regularly, and promote a strong anti-littering campaign. This is one area of possible improvement that would help our students to take pride in leading the way to solve real-life problems.

Beyond the school year, our staff also provides a lot of great STEAM-specific learning opportunities to students throughout the summer in the form of camps, often by collaborating with other teachers in Baldwin county. Some of these camps have reached student populations that otherwise may not have had the chance to attend STEAM-related camps.

For example, in 2018 teachers represented from the Fairhope Feeder Pattern came together, for a week, to pilot a STEAM Summer Camp available to the Rotary Youth Club students titled “Music to My Ears: An Acoustical Engineering Challenge” from Engineering is Elementary. The students, from the rotary club, represented low-income households, some of whom were African American. The pilot program was also the first opportunity for teachers across the community to collaborate together. The staff included: Kacie Hardman, the Pelican’s Nest Science Lab Director; Hilary McKinney, the FWES STEAM coach; Aaron Warner, also a FWES STEAM coach; Alicia McKenzie, JLN Fifth Grade teacher; Trina Jackson, a FIS sixth grade teacher; and Betsey Jennings, a FIS Fourth Grade. These educators met and planned the curriculum collaboratively.
https://app.seesaw.me/pages/shared_item?item_id=item.14a8d6b7-e6a3-4b6c-9440-69dd5244d4bc&share_token=yN5fTZ06QD25Pg_s6RBlsQ&mode=share

Aside from the Engineering is Elementary curriculum used, students had the opportunity to utilize and experience robots and musical instruments provided by FEEF classroom grants. Students solved real-world problems and designed and built an acoustic device to amplify sound. In addition, students coded a Kibo robot to play a musical instrument. Students kept a digital portfolio of their work. Through this digital portfolio students were able to share their understanding of the EDP. The students completed a culminating project to showcase their learning to parents and stakeholders on the final day of camp.

In the summer of 2019 a Kibo Early Elementary Robotics class was taught at our school, by Hilary McKinney and Allie Schultz, to children ages 5-7. 30% of the students present at the camp were girls.

Another class available to students, during the summer, is the STEAM Summer Technology Tutoring available to after-school care students at FWE each Wednesday. The class, which began in 2019, is taught by Hilary McKinney, and provides the opportunity for students to practice coding using Code.org and Scratch Junior. This program is available to children ages 5-14, in the after-school program, each summer.
https://app.seesaw.me/pages/shared_item?item_id=item.50975665-f199-4a1b-9e74-a643297dd4b7&share_token=ASrhJCuaT5S5J9SsCRQ6oA&mode=share

Two summer camps are available to FWES students at The Pelican’s Nest (PNSL) each summer: the STEAM Summer Camp, and the Bay Buddies Camp. Both programs are funded by FEEF. For a week in the summer, kindergarten through second grade students experience Bay Buddies Camp with Anne Frost Kennedy and Kacie Hardman. These early learners experience the bay through inquiry. Lessons during camp are organic and student-driven. Students learn to use collecting equipment to catch live organisms. Organisms collected are investigated back at the lab and researched. Some animals are kept to observe in the 55 gallon tanks throughout the week. The STEAM

Summer Camp, at The Pelican's Nest, began in 2016 and has continued every summer since. As of 2017 it's been available as two separate week-long sessions each summer and open to ages 5 through 12. The camp is co-taught by artist Ricky Trione and art educator Laurie Jordan, who collaborate on lesson planning with PNSL director, Kacie Hardman. During the STEAM camp, students conduct research on species located in the Gulf of Mexico and Mobile Bay, create artwork inspired by these amazing species, and explore the EDP. In addition, students conduct experiments with bay water, and explore coding and art creation using Spheros robots. In the future, we plan to continue providing summer camps so that students from diverse populations will have exposure to STEAM learning year-round.

Fairhope West has launched a focus on girls in STEAM. The school has implemented a Girls In STEAM Club that meets monthly to conduct STEAM activities and experiences. The girls answered a STEAM interest survey. They have guest speakers and teachers that lead them through hands-on lessons based on their interest level. To culminate the projects, the girls will meet and use their preferred skill to design a group project. The preferred skill was revealed during the collections of data from the survey taken during the orientation meeting. Club speakers and teaching guests include a technology expert, environmental scientist, pediatrician, and a director of nursing. Girls throughout the school are participating in book reads about Women in STEAM that are being videoed and viewed during our morning news broadcast. We have also dedicated space to showcase women in STEAM to motivate our girls at younger ages. Based on recent research, girls that are not exposed to STEAM careers prior to first grade are less likely to pursue a career in STEAM. FWE is presenting the annual First Grade Careers Parade, highlighting STEAM careers. Second grade created a wall of women in STEAM resulting from their Wax Museum PBL on Famous People and How They Impacted Our Society.

At Fairhope West our students benefit from the knowledge and expertise of community experts. Here are some of the community members who visit our school to showcase their profession: Ricky Trione, Kathryn Watkins & Judy Humphry (artists), Spinks Megginson (meteorologist), Jan Adams (dentist), Talbert (orthodontist), Dr Thompson (Veterinarian), Sherry Sullivan (mayor), Firefighters with fire engine, Joshua Gray Odem (Military), Nonie Taul (physical fitness), Chad Clark (banker), Elizabeth Heiv (Manatee Dauphin Island sighting network), Leave no Footprints Group, Roger Clay (scientist-sea turtles), John Dindo (Scientist-sharks), Wes Moore (Alligator Alley), Roger Clay (scientist-sea turtles), Alan Seals, (meteorologist). First grade visits many community workers and their places of business: the police station, library, post office, and the Fairhope History Museum. Sixth grade students prepare interview questions for restaurant owners and pose their inquiries via face-to-face or Zoom. Students have the opportunity through their Silent Auction to shadow the librarian, PE coaches, STEAM coaches, Pelican's Nest Scientists, and a Veterinarian.

Next Steps

In the future we plan to continue providing a variety of extracurricular and extended-day STEAM activities to all of our students with a special focus on opportunities provided for lower-income and non-white students and girls. In this way we continue to offer summer STEAM camp to Rotary Youth Club students so that black and low-income students are provided with great STEAM opportunities.

Additionally, every year we will continue to build on utilizing STEM practitioners, community experts, and other STEM partners to further enhance student's real-life application and understanding of STEM concepts. We hope to reach out to the city of Fairhope and mayor's office, also, so that our students can work with local leaders to have a direct impact on our community.