

# Palm Beach County 4-H

## An Open Web Resource for STEM Opportunities

### Making Connections Strategy 7

#### STEM Repository Building Through the Curation of an Online Tool to Link Young People to STEM Opportunities

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Creating an openly networked infrastructure to help young people access information and share their work can help them to make connections to peers with common interests and open up their networks in new ways. These openly networked infrastructures are often in the form of websites and tools designed to help youth showcase original work or access a curated suite of resources and opportunities they might not otherwise come across on their own. Openly networked infrastructures help to make purposeful connections across school, after school, and home settings for youth (Ito et al., 2020). Some popular examples of these types of openly networked spaces include components of Scratch, Minecraft, Roblox, and Ravelry. An openly networked infrastructure can also help point youth to new opportunities they might not see otherwise by curating a collection of resources and opportunities in one place.

As part of the Making Connections project, in coordination with the Florida Afterschool Network and Palm Beach County Library, Palm Beach County 4-H is aiming to create a locally relevant website that can help girls in their program link to networks and future opportunities in particular STEM fields.

Noelle, a 4-H Extension Agent in Palm Beach County, explained that they hoped to help youth find “opportunities related to everything from neuroscience to medical to marine science” so they can further explore their interests. She explained how she imagined this openly networked infrastructure approach might work:

“Maybe you’re really drawn to neuroscience, and so we want you to do a deeper dive about neuroscience. So we want you to talk about what you like about it, present that to others, and then *we’re going to show you this website that has all the opportunities related to everything from neuroscience to biomedical and marine science so if you want to explore further and ask, ‘where do I go from here? Is there an internship? A camp? Somebody I could talk to?’* and then it’s up to [the girls] to make that next step. We found because there were so many it was almost like information overload. They didn’t know where to start... so this is for if you are middle school, these are some things that you can do, here’s a tool for you. We hope that you continue.”

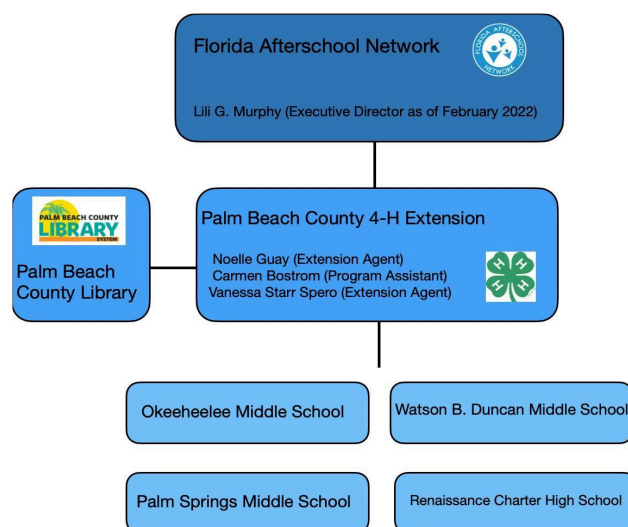


Figure 1. Organization of Florida Afterschool Network and Palm Beach County programming

The main focus of the openly networked infrastructure they aim to create is on information curation, rather than a social site where youth can share their in-progress work. Noelle explained that the result of this collaboration across the three agencies involved (Florida State Network, libraries, and 4-H) would be a locally-relevant resource for youth in their county to know where to go to further support interests cultivated through their participation in 4-H. Furthermore, the partnership includes a focus on a 4-H STEM program run across four

schools in Palm Beach County, and the website would first be made available to the teachers and students at these schools. The hope is that through collaboration with library partners, the website would help youth and their families sift through “information overload” and find opportunities that are a good fit for individual youth. This project represents a first step in the design and development of the website that would ground this openly networked infrastructure to link youth to locally curated opportunities.

### *Palm Beach County 4-H as a STEM-Focused Organization*

Palm Beach County 4-H serves a diverse population of over 17,000 youth across the county (as indicated by 6 or more hours of contract/participation in 4-H), with Noelle explaining that they have a large Latinx population and at one of their focus school sites (Okeehetee), many youth are in their first or second year in the United States. The county also has a large Haitian-Creole population and Latin American population, so they often need to provide language support through their programming. Palm Beach County is the largest county in Florida by area at 2,578 square miles and home to an estimated 1,492,191 people with over 283,516 of those being youth ages 5-18. Palm Beach County has 237 public and charter schools and is the 10th largest school district in the United States. Palm Beach School District’s student population is 38% White, 25% Black, 3% Asian, 30% Hispanic/Latino and 4% are more than one race; 16% of students have a disability. In our interview Noelle explained that the geographical makeup of Palm Beach County includes a range of socioeconomic landscapes, including “Palm Beach Island,” which is “very affluent, very wealthy” and then other areas that are “very rural” or have “very poor infrastructure” like “Belle Glade.” These rural areas may have more emphasis on “agriculture” and may not have “infrastructure with regards to grocery stores, recreational opportunities, things of that nature.” To offer a sense of the size of the county, Noelle explained that the 4-H office in Palm Beach is about an hour to their office in Belle Glade, about 50 minutes to Boca Raton (the county’s most southern area), and about 30 minutes to Jupiter and Palm Beach Gardens. Though diversity across the county is substantial, she also described many individual Palm Beach County communities as ethnically, racially, and socioeconomically diverse in their own right. Additionally, that Palm Beach County is the “largest agricultural producer East of the Mississippi,” which results in “a lot of transient workers, as well.” She explained, “if you drive from our side of the county into the western portion, you wouldn’t think you were in the same county. It doesn’t look the same, it doesn’t feel the same. You drive through 20 miles of corn and sugarcane to get to that area. So it’s a very different feel, very different needs.”

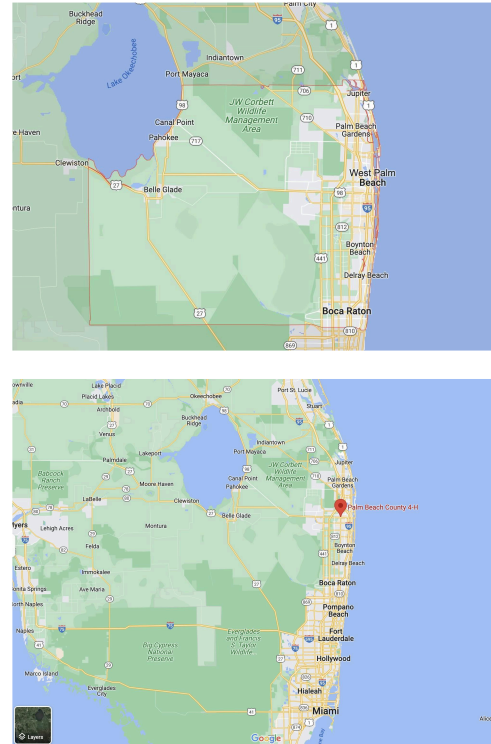


Figure 2. Palm Beach County with its diverse geographical makeup (top image) and location of Palm Beach County 4-H office

Many of the youth they serve find out about 4-H through their in school and after school partnerships, through local libraries, and through different events, fundraisers, and auctions. They also work with the University of Florida to send out information about what they do to potentially interested communities. Though 4-H is a household name, much of the specific work with which they engage is “word-of-mouth,” and also through their social media channels. In our interview, Noelle reflected on the reputation of 4-H as a brand and the ways they try to push common misconceptions of 4-H programming:

*“I feel that 4-H in general has a very misunderstood mission. We say we have a PR issue when it comes to 4-H. When most families or people have heard of 4-H, they think ‘you’re the ones who raise cows at the fair.’ So they don’t know that 4-H is for them. They don’t know the other opportunities available for them outside of livestock and agriculture. So we try to attend [different events] so people can come and learn more about 4-H and it’s not just that you have to have space to raise a cow.”*

## The 4-H Model and Approach to STEM in Palm Beach County

Noelle and Carmen (a 4-H Program Assistant) explained that they teach and follow the National 4-H Curriculum, which emphasizes the 4-H Essential Elements of Belonging, Independence, Mastery, and Generosity (4-H, 2008; Kress, 2004). The Essential Elements are woven into the facilitator guides and curriculum. *Belonging* means that youth know they are cared for and connected to a larger group. *Independence* means that youth feel they have a voice in decision-making processes and grow as independent thinkers. *Mastery* means that youth develop self-confidence in their ability to solve problems and challenges that arise. And finally, *Generosity* means that youth are connected to meaning, purpose, and their communities. Since its founding over 100 years ago, 4-H has prioritized an inquiry-based “learn by doing” approach, “experiential learning,” and has emphasized the need to “make learning fun” (Diem, 2005; Levings, 2014; Pracht et al., 2014). Through a variety of teaching methods and approaches including games and simulations, experiments, field trips, and group discussions, 4-H facilitators aim to help young people learn and thrive as part of a learning community. 4-H facilitators enact a Do-Reflect-Apply model when designing and creating learning experiences for young people. Noelle explained how the Do-Reflect-Apply model comes to life through some of the STEM programming they enact in their 4-H network. She explained:

*“We try to introduce what we're doing at some level of science inquiry—so, what are we doing? What's happening? And it goes back to that Do-Reflect-Apply model and asking questions to understand what's happening. We have curriculum that's geared around STEM [like] junk drawer robotics where they can use everyday materials to solve problems and see that science doesn't have to be expensive to be effective. We have a National Youth Science Day event every year...we did a code your world activity where kids learn how to code their own dance and learn how to animate their names in Scratch so there's a little bit of everything when it comes to STEM. And at the core of that Do-Reflect-Apply model we integrate a lot of science inquiry in STEM. We always try to tie it back to, ‘how does this impact you and why is it important that you know about any of this? What do you think you can do with that [information]? How do you teach somebody else or how do you share that information?”*

4-H became involved in this “making connections” project through their connections to leadership at Florida Afterschool Network (the director has since left his position and Noelle has unofficially taken over the project for the network). Noelle explained that 4-H has a very close relationship with the state network and that they were drawn to this grant because of their interest in expanding opportunities for youth beyond the isolated 4-H sessions to future careers and other STEM-related experiences.

### Background on 4-H Program Leaders

Noelle works as a 4-H Extension Agent and also for Palm Beach County government. She has her BA and MA in biological sciences and got into 4-H after being a teaching assistant in graduate school. The hands-on component of 4-H appealed to her. Through 4-H, Noelle drew from her background and previous experiences to create a marine science camp. Overall, she wants youth to see the diversity available to them in STEM fields, that STEM isn't just one thing. She especially loves working with young girls because she wants them to be exposed to a range of opportunities available to them. In her role as an extension agent, she develops programs and curriculum and helps find money to support those programs. Noelle is responsible for the more urban area of the county (the eastern portion), while her counterpart is responsible for the more rural area (western portion).

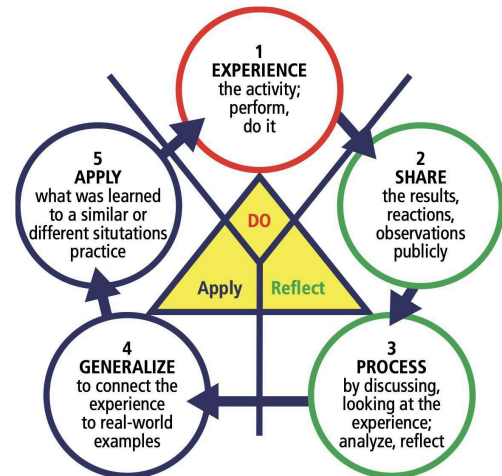


Figure 3. 4-H Do-Reflect-Apply model

Carmen works as a Program Assistant with Palm Beach County 4-H. Before that, she worked at the family nutrition program through the University of Florida. Through 4-H she gets to teach youth about healthy living, and that is what brought her to 4-H in the first place. She explained in our interview that she is particularly interested in teaching healthy living “because a lot of kids don’t get nutrition information, simple things like how to cook, food safety that are being dropped in schools.” She considers healthy living STEM and offers an example from their programming in which they looked at and grew their own “microgerms.” Carmen began working with 4-H in January of 2018 and in addition to a focus on healthy living, she does a little bit of everything related to STEM, from teaching robotics to embryology.

## **Design and Iteration on the Website**

With the stipend support, Noelle explained that they hired Barbara Hernandez as a Program Assistant to help build out the website, as well as support in-person facilitation of STEM activities. We spoke with Barbara, who explained her search process in terms of finding locally-relevant opportunities to host on the website. She explained, “You start out very broad, like ‘science programs for youth in Palm Beach County’ and then I get more narrowed down in terms of kinds of careers or topics like robotics.” In addition to opportunities that require a fee, Barbara was sure to include volunteer opportunities or those that might offer scholarships to students. To help surface the relevance of the website they are in the process of creating, Barbara explained that during her facilitation work, they ran a session with students during which they had them first look for opportunities they were interested in, and through this activity, students realized it was somewhat difficult to find relevant opportunities in their county. Barbara then showed them the website and list of opportunities they were in the process of creating and asked students for feedback. As she searches for opportunities, Barbara aims to include topics students seem most interested in—for example, some students specifically requested information on opportunities related to architecture.

The Palm Beach County website already has an active teen resource page and so the decision to house this new site within the library resources was intentional and will help to drive traffic to the new site. Amy McKnight, the graphic designer working on the project, explained that though they don’t have much say in the overall website design seeing as it is housed on the county’s mainpage, they hope to keep their part of the website “clean and straightforward.” Because they imagine that the STEM repository will eventually include a very long list of opportunities, the categories at the top will help visitors click through to find the most relevant pieces. Amy also explained that they will need to “keep on it” for the website to remain timely and relevant since so many of the opportunities are time sensitive.

The design of the library-housed website is still in development, but the hope is that it will continue to serve as a longstanding resource for 4-H students and families hoping to continue pursuing STEM learning experiences beyond their current STEM experiences with 4-H. Noelle explained that through this project, they aim to create a “user-friendly” site that is “visually pleasing but also not challenging to navigate.”

## **How Palm Beach County 4-H Prepared for STEM Repository Building Through the Curation of an Online Tool to Link Young People to STEM Opportunities**

- Coordination across multiple organizations (e.g., libraries, 4-H, schools) that are united toward similar and central goals (e.g., sparking STEM interest and providing opportunities for youth to further those interests)
- Design and development of the openly networked infrastructure should be to user-centered, tailored around the youth perspective and point-of-view
- Educators and leaders need to have a good sense of the ways in which they can inspire participation in their families and students so that the openly networked infrastructure is taken up by the intended users.
- Knowledge of locally relevant opportunities and ways to support youth as they navigate those opportunities

## About the Making Connections Project: Fostering Connections and Pathways for Youth across STEM Learning Ecosystems

STEM Next and the Connected Learning Lab at UCI have partnered to support state and regional out of school networks as they develop and strengthen an ecological and connected approach to STEM learning. The case studies series represent real world examples that are part of a larger effort to develop and improve connection strategies that strengthen STEM learning ecosystems, centering the experiences, mobility, and futures of individual learners and their families across state and regional networks.

Each case study in this series takes a close look at a partner organization's approach to one of the eight strategies for connecting: 1) A wraparound approach; 2) Coordinating between in school and out of school; 3) Giving back to one's community; 4) Near peer or industry mentorship; 5) Translating youth interests in to STEM career opportunities; 6) Building relationships with families; 7) Curating online tools; or 8) Creating open portfolios. These case studies are not exhaustive; they are examples of coordinating and brokering that can be used to spark ideas and inspire growth.

For more information on the project and the strategies, visit <https://stemnext.org/stem-pathways> and [connectedlearning.uci.edu/projects/making-connections/](https://connectedlearning.uci.edu/projects/making-connections/)

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