



Northeast Florida Regional STEM2 Hub High Quality Afterschool Programs Alignment, Recommendations & Planning Guide



For Information Contact

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Robotic technology is changing the world! Autonomous processes are everywhere. We need to assure all children have access to robotic technologies. Here are just a few reasons why: Here are five reasons to teach robotics in schools: 1. Children find it fun; 2. Effective way of introducing programming to students; 3. Provides skills useful in future employment; 4. Suitable for children with a range of abilities; and 5. Demystifies a complex technology. Below are some robotic programs that we recommend.

- **FIRST LEGO League Junior (FLL Jr.) Robotics:**
Program Description: FLL Junior is an introductory program that gives students the opportunity to work with the WeDo robot. The program can be run as a club or as part of a competitive FIRST program. While the FLL Junior Teams do not “compete” they do attend competitions where they showcase their work and learn from the older students involved in the FIRST programs.
Learn more at: <https://www.firstinspires.org/robotics/flljr/challenge-and-season>
- **FIRST LEGO League (FLL) Robotics**
Program Description: FLL is the first competitive level of the FIRST program. Students use the EV2 robot to learn to code and prepare to compete. Students develop a research project around a problem in the theme, program their robot to complete missions, and demonstrate their ability to work as a team to solve a unique challenge.
Learn more at: <https://www.firstinspires.org/robotics/fll>
- **FIRST Tech Challenge (FTC) Robotics**
Program Description: FTC continue the work students began in FLL, but the platform for the robot is more advanced. It’s way more than building robots. *FIRST* Tech Challenge teams (10+ members, grades 7-12) are challenged to design, build, program, and operate robots to compete in a head-to-head challenge in an alliance format. Participants call it “the hardest fun you’ll ever have!” Guided by adult Coaches and Mentors, students develop STEM skills and practice engineering principles (like keeping an engineering notebook), while realizing the value of hard work, innovation, and sharing ideas. The robot kit is reusable from year-to-year and can be programmed using a variety of languages, including Java. Teams also must raise funds, design and market their team brand, and do community outreach for which they can win awards. Participants have access to tens of millions of dollars in college scholarships. Each season concludes with Super-Regional Championships and an exciting championship.
Learn more at: <https://www.firstinspires.org/robotics/ftc/what-is-first-tech-challenge>



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Computer Science/Coding

Program Description: Technology is transforming society at an unprecedented rate. Whether it's smartphones or social networks, self-driving cars or personalized medicine, nothing embodies the American Dream so much as the opportunity to change or even reinvent the world with technology. And participating in this world requires access to computer science in our schools and our after-school programs. This makes computer science and coding amongst the most important skills for all students. In the future workplace, the ability to problem-solve, navigate, and create using technology will be imperative. STEM2 Hub promotes threading critical exposure to coding & computer science across all programs. Under the umbrella of computer science falls most of the programs alignment with this document. Computer science specific programs include:

Code.org

Program Description: Leveled coding resources are available at the Code.org website. Due to our regional partnership with Code.org, full training and professional development will be provided to program staff to implement computer science fundamentals with students in elementary grades. Resources are available on line which can be sorted by grade level, skill level, time available, and level of scaffolding available for students.

For additional information visit: www.code.org

Girls Who Code

Computing is where the jobs are — and where they will be in the future — but our girls are being left behind. Girls Who Code values diversity, equity and inclusion as essential to our mission. We focus our work not only on gender diversity but also on young women who are historically underrepresented in computer science fields. The curriculum is designed for students with a wide range of computer science experience. There are activities for girls with **zero** computer science experience all the way up to activities that introduce college-level concepts. The broad set of soft and hard skills we teach include teamwork, time management, communication, variables, functions, conditionals, and loops.

Minecraft

A game-based learning platform with standards-aligned content across K12 subjects and special features designed for classroom use. Minecraft is already supporting thousands of educators in over Northeast Florida Regional STEM2 Hub, Inc. is a Florida non-profit corporation, and is an organization exempt from taxation under section 501(c)(3) of the IRS Tax Code. For further information, or to make a donation, contact Kathleen Schofield, Executive Director at kathleen@stem2hub.org or visit our website www.stem2hub.org 904-502-0958



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100 countries. Through project-based lessons, students build critical 21st century skills like collaboration, creative problem solving and digital citizenship. set of tutorials and game features brings subjects to life in Minecraft: Education Edition and supports educators in classroom management and formative assessment. From computer science to mixed reality, Minecraft: Education Edition provides endless opportunities for exploration, storytelling and digital learning.

WozU Curriculum Pathways:

Program Description: This curriculum provides rigorous, hands-on, K-10 learning environment focused on STEAM concepts creates a pipeline of students well prepared to start the dual enrollment programs, if they choose. Career Pathways in Coding, Cyber Security, Engineering, Mobile Development, and Drone Piloting & Repair represent examples of the rich projects and experiences Woz U Education brings to schools and to afterschool programs.

3D Printing Club:

Program Description: 3D printing is critical skill for students to be future-ready. Innovation and advancement in all areas from medicine to manufacturing are happening at light speed! There are several recommended approaches to your 3D Printing Club:

- WozU Curriculum Pathway
- My STEM Kits Curriculum Pathway: The My STEM Kits curriculum is fully aligned with Florida Standards and is incorporated into the Florida C-PALMS Clearing House.

Cybersecurity Club:

Program Description: Cybersecurity is amongst the most critical areas for assuring business, personal, and national security. Early introduction to cybersecurity career exploration allow students to build awareness of this critical field.

- CyberPatriots
- WozU Curriculum Pathway

Drone Club:

Program Description: A comprehensive, grade-banded system with a career focus leading to opportunities in the careers in the newly emerging drone industry. Career options abound in areas of drone pilot for disaster exploration, rail track inspection, package delivery, movie filming, agriculture, real estate, and the military.

- WozU Curriculum Pathway – Science, Math & Career Exploration through Drones.



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Bicycle Club

Program Description: The STEM Bicycle Club is a “heads on, hands on” project that engages middle school students for approximately 10 weeks in the after-school environment. Students break down and re-assemble bicycles that they get to keep! The STEM Bicycle Club builds students’ confidence and problem-solving skills while reinforcing and bringing relevance to the math and science principles taught during the school day. Through the involvement of their coaches, the club also exposes students to STEM career possibilities.

Learning Blade

Program Description: Learning Blade is an on-line, web-based career exploration curriculum. Learning Blade is an efficient and effective tool designed to grab your students’ attention while introducing them to the careers, tools and technology found throughout the STEM fields. Much more than just another tool, Learning Blade is different. This is a high-quality supplemental curriculum that is focused on offering your students real world learning experiences in STEM education. It does this by providing student-ready, interactive missions that integrate the processes of developing a student’s interest in STEM, building awareness of STEM career opportunities, and reinforcing academic standards and skills. Fully Internet-based running on desktops and tablets including iPads, Learning Blade does not require extensive teacher training or classroom materials and is complementary to project- or lab-based activities. The unique organization allows our activities to be utilized both in an entertaining self-paced game environment and as skill practice within academic classrooms.

Defined STEM

Program Description: Defined STEM is a K-12 project-based learning solution that provides engaging, authentic lessons built around careers. The cross-curricular projects provide opportunities for students to deepen understanding and apply their knowledge in real world scenarios aligned by career cluster, and to state standards. This curriculum provides an opportunity to develop projects that are an extension and application of the standards that students work on during the school day.



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Math Counts

Program Description: Foundational, strong math content knowledge is important as students prepare for the STEM careers of the future! Math counts is a fun competition that is designed to provide engaging student experiences while strengthening fundamental skills. There are two versions of Math Counts:

- The National Math Club is free and designed to be flexible so many types of groups can participate. The primary resource, given to all educators who register for this free program, is the Club in a Binder with math games. Club games are designed to last 30-90 minutes (depending on the group) so every game can be used for 1-2 club meetings.
Learn more at: <https://www.mathcounts.org/programs/math-club>
- The Competition Series has 4 levels of competition—school, chapter, state and national. Each level of competition is comprised of 4 rounds—Sprint, Target, Team and Countdown Round. Altogether the rounds are designed to take about 3 hours to complete.
Learn more at: <https://www.mathcounts.org/programs/competition-series>

Microsoft Mixed and Augmented Reality Clubs

With the increasing prevalence of technology in our daily lives, there is a notable increase in the demand for people with a strong grounding in STEM (Science, Technology, Engineering and Mathematics) by employers. To encourage interest in STEM, Microsoft are unveiling new Windows 10 devices for schools and education centers – a list which included Mixed reality (MR) devices. Mixed reality (MR), sometimes referred to as hybrid reality, is the merging of real and virtual worlds to produce new environments and visualizations where physical and digital objects co-exist and interact in real time. Explore the world and beyond, tied to careers and to academic experiences. Explore content, learn to develop apps.

Industry Certification Preparation

- Prepare students for relevant industry certifications leading to careers in technology.
- Program Currently Under Development. Details to follow.