The Strong TIES STEM Program applies an integrated approach to STEM engagement for community-building and increasing interest in STEM among youth and specifically targeting African American middle and high school girls. The youth gains an understanding of how the Strong TIES Phoenix, Arizona based STEM program integrates African traditions like rhythm, fractals, call-and-response, and motion with STEM education. Our youth are given a glimpse into how STEM and African traditions interplay to cultivate principles applied throughout STEM disciplines, such as collaboration, idea creation, interface definition and team building. African traditions and principles are brought to life through the use of computer science principles, digital designs, and play. Lastly, our program applies experiential learning for amplifying STEM principles. This integrated approach to STEM learning bridges past, present and future techniques for engaging African American girls.

We use exercises from ImprovScience for deeper understanding of what, how and why rhythm is an important principle for idea creation, team building, and group dynamics. In STEM disciplines, each product or services follow a "life-cycle" that involves idea creation, requirements, design, develop, and test in an iterative manner for continued improvements. Fundamental to the life-cycle are the people, team building, a sense of acceptance, cooperation, and skills needed for collaborative efforts. Our Strong TIES program uses these playful exercises to highlight key skills needed for STEM disciplines.

Once the student participates in the experiential learning as described above, they're ready to engage with the project-based leaning using the computer for digital designs or learning concepts such as the science and mathematics in sound. When the students are lead to create their own digital design, foundational principles of computer science are reinforced, such as design creation that helps the student to explore exciting things they want to see come alive with the aide of the computer. The students learn concepts such as algorithms, conditionals, iteration, and functions. Our "What's up with noises" project focuses on the concept of sound as found in science and mathematics. The student learns a) the biology and physics of sound, b) the use of technology for audio recording sound using software and the microphone, c) how engineers apply vibration, wavelengths, frequency, and amplification when producing sound, d) mathematics found in sound, such as fractions, Pythagoras, and geometry, and e) lastly, into the arts and musical expressions.

Our fun and engaging approach to STEM learning has shown to be effective igniting interest with African American girls in Phoenix, Arizona communities. Our belief is when students can see themselves as STEM innovators, this will lead them to a place of acceptance and an understanding of belonging and a full emersion into STEM disciplines.

The Strong TIES STEM Program includes camps, day workshops and talks. Over the last 2 years, our program has impacted over 70 African American girls by introducing them STEM. And our half-day week long camps with a focus on digital design, impacted over 50 students last summer. This coming summer the plan is to conduct 4 full-day week long camps.