**PTA / SCHOOL WEBSITE**

**The 4-1-1 on our STEM Lab**

**What is STEM?**

**S**cience

**T**echnology

**E**ngineering

**M**ath

**Why do we need a STEM Lab?**

Computer science builds on computer literacy, educational technology, digital citizenship, and information technology. We want our students to experience computer science as a creative process. Following the California Computer Science standards, students need to move beyond the role of users of computing technology and advance towards becoming active creators and innovators, engaged with computer science as an artistic and collaborative process.

In the Lunada Bay STEM lab students will begin learning about computer science. The STEM lab will center on project-based learning to support communication and collaboration within research teams. We want to inspire critical thinking, problem solving, creativity and innovation. These are all important skills students need to develop to thrive and be successful in the future.

**The STEM Room Remodel**

Lunada Bay Elementary is a one-to-one school, meaning we have one computer for every student throughout the school. Essentially, every classroom can serve as a computer lab, making the computer lab model rather obsolete. This presents an excellent opportunity to transform the space into a STEM lab.

All items will be removed from the existing computer room, including the cabinets. The room will be painted, a new white board will be installed, and two STEM-related murals constructed as well. In addition, a hands-on Lego Wall is sure to generate excitement with all students.

**The Hardware**

We also anticipate the installation of new STEM Lab furniture, including adjustable tables and chairs to accommodate children in kindergarten through fifth grades. This furniture will support collaborative work groups. We will be purchasing a STEM Cart to store computer science products and acquiring a new touchscreen Chrome Book cart for the Lab. Included in our implementation is lab sets of [Cubelets](https://www.modrobotics.com/cubelets/), [Ozobots](https://ozobot.com/), [Sphereo](https://www.sphero.com/), [Lego WeDO](https://education.lego.com/en-us/elementary/intro/wedo2), [Littlebits](https://littlebits.com/education/), [Arduino](http://www.podpi.com/), and [Makey Makey](https://makeymakey.com/) to assist us in teaching our children the basics of computer science, including programing and coding. We will constantly review developments in computer science technology and the replenishment of consumables and updates, so as to remain at the cutting edge of STEM instruction in elementary school.

* An **Ozobot** is a small and smart line-following robot. The robot uses precise movement and sensors to follow and react to colors on a page or screen.
* The **Cubelets** are small color-coded cubes that magnetically stick together to form a variety of simple modular robots.
* **Makey** **Makey** is an invention kit for everyone. It is an electronic invention tool that connects everyday objects to computer programs. Using a circuit board, alligator clips, and a USB cable, it uses closed loop electrical signals to send the computer either a keyboard stroke or mouse click signal.
* **LEGO** **WeDo** is a system of robotics hardware and software.
* **Sphero** is a spherical robot capable of rolling about. It is controlled by a computer or tablet.
* **PodPi** is an immersive, literacy based and hands-on program used to learn JavaScript coding and electronics. Arduino-based kits are microcontrollers for building digital devices and interactive objects that can sense and control objects in the physical world. It uses a programmed learning system made up of a series of adventures coupled with fun comic books.
* **LittleBits** is an open source library of modular electronics, which snap together with small magnets for prototyping and learning.

**Teacher training/Computer Tech Aide**

Teachers and our computer tech aide will receive six hours of STEM professional development on all products as well as a laptop containing hundreds of standards-aligned lessons supporting the products.

**The Curriculum**

Robotics, programming, computer science and coding will be introduced to all K-5 students through standards-aligned, scaffolded activities and curricula that begin with the basics of computer science and build in complexity through the progression of all grades. Teachers will give Next Generation Science Standards (NGSS) lessons via Amplify, STEMscopes, Mystery Science, other standards aligned curriculum. Grades K-5 will work in computer science, with instruction including coding. The STEM Lab room environment will be monitored and reviewed to conduct appropriate needs assessments.

**Here is what your child can expect to experience**

In each grade level students will work with a computer science product. Starting in kindergarten students will learn the fundamentals of building a simple robot, sequencing, patterns and problem solving. As students progress through the grade levels, they will be exposed to new and different types of computer science products, building upon previously learned information. Working with partners and small groups, students will solve real-world problems and begin modeling solutions using this technology. Through the basics of computer programing or coding students solve problems and communicate findings.

It is important for our parents, students, and other stakeholders to realize the importance we attach to STEM education, and also to get a feeling for some of the actual technology that may be implemented in the Luanda Bay STEM lab. Our students deserve to be prepared as they matriculate through Lunada Bay into the fast-paced development of STEM in their later education, and in the world they will face as adults.