

## Dear Parents, Teachers, and Grade 8~9 Students

On October 23 to October 28, Hua Quan Village and Sino-Exchange will be hosting a free community outreach program that will focus on STEM education for middle school students living in the general Yingtan area. The entire program will be available completely free of charge for those selected to participate in this 1 week after-school event. This program of study will be specifically geared towards grade 8 & 9 students and will focus on aerospace engineering. The entire program will run for 1 week after school with 2 lessons per day. There will be a short break between each lesson. A schedule of the program is listed below.

### Grade 8~9 STEM Outreach Program (Structural Engineering) STEAM Club

Start	Finish	Monday, Oct. 23	Tuesday, Oct. 24	Wednesday Oct. 25	Thursday Oct. 26	Friday Oct. 27
4:30	5:25	Lesson 1	Lesson 3	Lesson 5	Lesson 7	Lesson 9
5:25	5:30	Break	Break	Break	Break	Break
5:30	6:25	Lesson 2	Lesson 4	Lesson 6	Lesson 8	Lesson 10

Then on Saturday October 28<sup>th</sup>, we will have a full day of activities planned for our students, and these activities will also be open to the public as well. We will start with some time for students to finish up their projects, set up their exhibition booth, and practice their presentations. This will then be followed by a formal science fair where members of the public will be invited to see the students' projects. Local media, both newspaper and television studios, have also been invited to come as well. The science fair will then be followed by a community art, a unique cultural arts and crafts activity that will be held by Mrs. Salpi. During this activity, the students are encouraged to invite a sibling, parent, or grandparent with them to spend the afternoon together at the village. Ms. Ma and Ms. Candelaria have prepared a guided museum tour for all our guests. Both events will be free to the public. Finally, during our awards ceremony, we will offer 24 students (12 in each group) a guaranteed and fully paid for scholarships for our next STEM outreach program.

A summarized schedule of the final day is as follows, and an overview of each lesson is available on the following page.

### Program Wrap-up and Finale

Start	Finish	Saturday, Oct. 28
9:00	12:00	Free time to complete or perfect projects etc. <b>(STEAM Club)</b>
12:00	1:00	Lunch
1:00	1:30	Science Fair
1:30	3:00	Group A Guided Tour of Cultural Museum <b>(Chinese Culture Club)</b> Group B Family Hand Crafts <b>(Western Arts and Crafts Club)</b>
3:00	4:30	Group B Guided Tour of Cultural Museum <b>(Chinese Culture Club)</b> Group A Family Hand Crafts <b>(Western Arts and Crafts Club)</b>
4:30	5:00	Awards & Scholarships

***Lesson 1: Introduction to Bridge Design & Begin Mini Bridge Project (side 1)***

In this lesson, students will learn some basic vocabulary and concepts related to the design of a standard bridge. They will then build a “mini bridge” to help them understand how planner supports are created and assembled to form a 3-dimensional structure.

***Lesson 2: Complete the Mini Bridge Project (Side 2, Top, and Bottom)***

Continuing from the previous lesson, students will complete the remaining sides of their “mini-bridge” and will assemble all the components to create a 3-dimensional structure.

***Lesson 3: Introduction to Truss Design***

With a basic understanding of bridge design, students will be introduced to different trusses.

***Lesson 4: Original Bridge Design***

With a basic understanding of different design concepts, students will need to evaluate the pros and cons of each design concept as they create their own original bridge design. These designs may be based on existing designs or may combine different aspects of multiple standard truss designs to create an entirely new design that could be built and tested in the real world.

***Lesson 5: Mathematical Concepts in Bridge Design***

In this lesson, students will learn about different mathematical concepts related to a bridge's design and structure. NOTE: Mathematical concepts and vocabulary are based on a standard grade 8 math curriculum.

***Lesson 6: Bridge Design Peer Review***

Now that each student has their own original bridge design, they will begin a formal peer review process where they will evaluate the pros and cons of other students design concepts and compare those ideas against their own designs.

***Lesson 7: Talent Scouting & Bridge Redesign***

Just like in the real world, companies will try to recruit the most talented individuals. In this lesson students will explore the ethical issues related to talent scouting/poaching and will have the ability to recruit new team members to their group for the final project. Once each group has settled on their final team (which could be the original 2 members, or a new team of 3), each group will begin the process of finalizing an original bridge design that their group will build for the final project.

***Lesson 8: Building the New Bridge (Side 1)***

Each group will begin the process of building their new original bridge design and should have 1 side completed by the end of class.

***Lesson 9: Building the New Bridge (Side 2)***

Continuing with the original bridge design, each group should complete the second side of their bridge.

***Lesson 10: Building the New Bridge (Top, Bottom, and Testing)***

By the end of this lesson each group should have completed the top and bottom of their bridges, assembled the 4 sections, and tested their bridge to see if it is sturdy enough to support the minimum load requirements.