



STEAMing Ahead

Our vision: *To create a learning culture of curiosity in which students will engage in the world they are living in.*

Term 3 & 4 STEAM Newsletter

Dear Parents and Caregivers,



I cannot think of a better way to end up the year than the Innovation EXPO held on the 30th November.

The Expo provided a platform for the Year 10 STEAM students to celebrate the learning after 2 years of amazing learning experiences and share these with both the current Year 9 students as well as the parents and Year 8 students that have been accepted into the STEAM programme for 2019.

Five groups were voted to face the Dragons Den. We had the privilege to have some amazing industry female role models as our judges which include Victoria Mahan, Director of HP NZ, Vanessa Sorenson, Enterprise Director at Microsoft and Megan Darby, Founder and CEO of ESTEAM builder.



Pictured above includes the students that faced the Dragon Den's and the Judges.

Below are the winners of the Community Award and Innovation Award with their Awards which have been designed by the STEAM students and laser cut.



Shaun Gear, Principal Adviser for the Ministry of Education - Secondary Tertiary, joined us for the Innovation Expo and this is what he and the Judges had to say:

"The Innovation Expo showcased the future and potential of the girls lucky enough to be part of the STEAM programme. All the teams I engaged with had a common purpose and understanding of the learning and skills they have gained. The smart learning, smart thinking and smart doing using the design thinking approach enabled the girls to develop and demonstrate critical skills and knowledge that are highly desired by employers today and in the future of work." **Shaun Gear, Principal Adviser**

"To start, I think that STEAM programmes such as the one at Westlake Girls is one of the greatest ways that we can get students prepared for the future. It's incredibly important for employers such as HP to identify candidates who have a diverse set of experiences. While traditional education focuses on individual study and single-subject syllabus-focused curriculum, what employers require is fundamentally different. We are seeking candidates who can collaborate, work together on projects and be agile and adaptable." **Victoria Mahan, Director HP NZ**

"Congratulations Westlake Girls for being a leader in supporting students to flourish and equipping them with the 21st Century skills that are so needed and the teams'

parents that have supported their children to pursue this wonderful opportunity." **Megan Darby, CEO ESTEAM Builder**

"I was extremely impressed with the creativity and thought leadership that the girls displayed during the Expo. They all need to be extremely proud of how they presented the idea, how clear it was and also helping community issues. Using Tech to expand what they believe can be solved was simply outstanding. It was extremely hard to select a winner however it was unanimous that the two winning teams really took it to the next level." **Vanessa Sorenson, Enterprise Director, Microsoft**

STEAM Showcase

Lets not forget the STEAM Showcase which happened back in August where we had the privilege to hear from Ron Tyson from New Zealand Ocean Technology Ltd, who spoke on the application of Autonomous Robots in the field of Marine Biology, as part of a scientific mission to study sharks. We also heard from Commander Emma Grant from the Royal New Zealand Navy who addressed some of the barriers around women in STEAM and spoke wisely about a positive mindset, empowering the students to consider careers in STEAM.

"I loved helping out at the STEAM Showcase because it was a chance to show off all of the awesome work we have done so far in the year," said one student. "The showcase allowed the parents, siblings and even other teachers to see all of the different projects we have been working on in different STEAM subjects."



Finally, I would like to thank the parent community for all your support, have a lovely Christmas and a relaxing holiday.

Susana Tomaz (Stomaz@westlakegirls.school.nz), TIC for STEAM, Robotics and FutureTech Teacher.



Pictured above are Caitlin McConchie, Zoe Wu and Revathy Gunasegaran (left). Arrington Hannah, Sophie Dykgraaf, Maia McKibbin-Golf (right)

Below: Commander Emma Grant and Ron Tyson.

Year 9 STEAM

English and Social Studies

This term we focused on the theme War and Peace through the context of World War Two and different system of government. We also celebrated the 125 year anniversary of Women's Suffrage in Aotearoa/New Zealand.



Project Runway Task- students created outfits to reflect different systems of government, including democracy and dictatorship.

World War Two was a significant period of upheaval for people and affected people in many different ways. We explored many different perspectives on the effects of war through a film study on Little Boy about American-Japanese relations during the war and by inviting special speakers to address students in our shared lessons. We were fortunate to hear Takeaki and Takako Kurdo who survived the Atomic Bombing of Hiroshima and Vivianne Siegel who lived through the Holocaust.



Vivi tells her story of survival during the Holocaust.

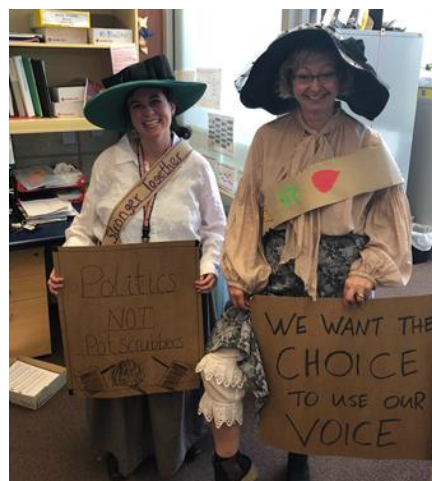
On the 19th of September we celebrated 125 years of Women's Suffrage in New Zealand/Aotearoa. We have looked at different texts created at the time by Kate Sheppard and others included in the campaign for enfranchisement. We created Suffragette sashes that included different symbols associated with gender equality issues from the past and present. Furthermore, students

also visited Auckland Museum and got to look at original primary sources, such as letters written by Kate Sheppard and also saw the 'Are We There Yet?' exhibition about



gender equality in our society.

School booking officer Muriel McGlone with Amena, Hannah and Damla in the Museum Library.



Ms McRae and Mrs McElroy as Suffragists!

Upon returning to school in Term 4 students completed their own 'Are We There Yet?' Mini Exhibition, which is currently being displayed in the top of A Block. Students interviewed an inspirational woman in community. This could have been a family member, teacher, coach or community leader. Some examples of women interviewed were Pania Newton (lawyer and land rights activist), Judy Ann Blakely (Chairperson of the Mairangi Arts Centre) and Carolyn Robinson (journalist). We were very impressed with their efforts.



Students had an opportunity to investigate the relationship between different variables, relating to the cancer development, using a random sample.. They discovered that using the relationship seen in the scatter plot, they could come up with a formula to predict the age of cancer attained when they know the age of exposure. . Some students investigated the relationship between the distance of epicentre and the bone marrow radiation dose. They noticed that it was strong negative relationship as expected, until 1600 km away. This investigation was a good example of Statistics being applied in real life.

Maths and Science



The theme across all four core subjects. 'War & Peace'

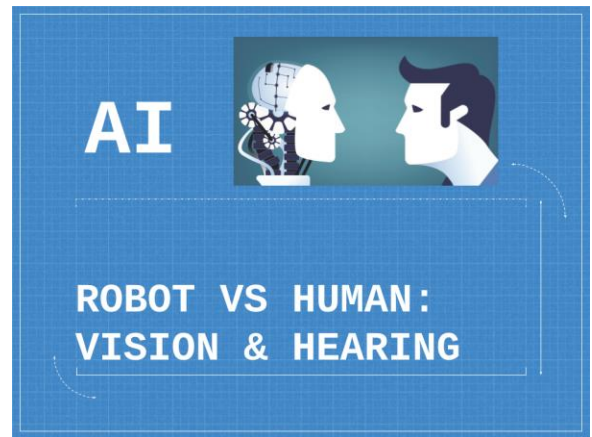
In Science they studied Atomic structure & Matter topic which was extended by conducting research on "Nuclear Power in War & Peace". Students were researching what is radioactivity and how it can be used to generate energy, as well as what are the impacts of radioactivity on living organisms. They've combined their scientific knowledge with statistical data research .



Using the dataset from "the Life Span Study", Japan, which includes about 120,000 subjects selected from residents of Hiroshima and Nagasaki. This dataset is widely used for the

research on the effect of radiation on the cause of death and incidence of cancer in the medical world.

Students also had an opportunity to do practical activities on separating mixtures techniques, which then they connected to create flow diagram for process of extracting water on Mars for human habitat. They had to engage in researching differentiating types of water mixtures present as polar caps vs brine ice deposits beneath the Martian surface.



As the final yearly project students were comparing and contrasting artificial intelligence with humans, with a particular focus on sensory perceptions. Students were engaged with synthesis of their knowledge previously gained in science and robotic topics. This enabled them to create meaningful connections and interesting class discussion. They've created a list of limitations and advantages as a final summary.

Papertronics and E-Textiles

This term our knowledge of circuitry and how to incorporate recycled materials into an interactive art form have grown immensely. With help from a presentation by Susana Tomaz explaining the science behind circuits and the effectiveness of our designs, we have progressed and widened our skill sets. We have predominantly worked on our individual paper circuitry designs. This involved exploring Photoshop image editing techniques, integrating a pop-up feature into our paper circuit, and sharing ideas with each other. This unit has been full of new experiences and challenges which have positively pushed us out of our comfort zones. We each faced our own struggles on the way, whether it had been deciding on a design or simply figuring out the Photoshop tools, yet we all overcame them and were rewarded with our final product. - Ray Carr and Nikka Caraig



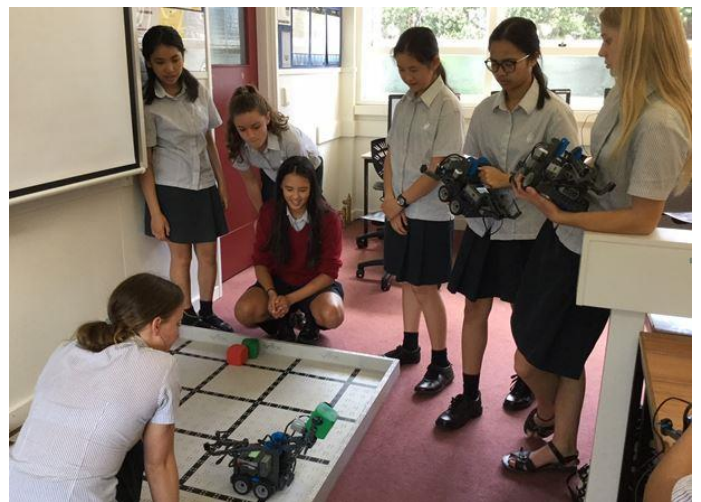
Robotics

Students have been developing their programming skills to incorporate the use of sensors such as distance sensor, colour sensor and gyro sensor. They had fun incorporating the use of two sensors together on the latest challenge - Rainbow challenge.

```
// start robot
// red until 700mm
3> setMultipleMotors ( -50 , motor1 , motor6 , noMotor , noMotor );
4> setTouchLEDColour ( touchLED , colorRed );
5> waitUntil ( getDistanceValue(distanceMM) <= 700 );
// orange until 600mm
7> setTouchLEDColour ( touchLED , colorOrange );
8> waitUntil ( getDistanceValue(distanceMM) <= 600 );
// yellow until 500mm
10> setTouchLEDColour ( touchLED , colorYellow );
11> waitUntil ( getDistanceValue(distanceMM) <= 500 );
// green until 400mm
13> setTouchLEDColour ( touchLED , colorGreen );
14> waitUntil ( getDistanceValue(distanceMM) <= 400 );
// blue until 300mm
16> setTouchLEDColour ( touchLED , colorBlue );
17> waitUntil ( getDistanceValue(distanceMM) <= 300 );
// indigo until 200mm
19> setTouchLEDColour ( touchLED , colorDarkBlue );
20> waitUntil ( getDistanceValue(distanceMM) <= 200 );
// violet until 100mm
22> setTouchLEDColour ( touchLED , colorViolet );
23> waitUntil ( getDistanceValue(distanceMM) <= 100 );
24> stopAllMotors ( );
// End of program
26>
```

Students used the distance sensor, the LED touch sensor.

As a final challenge in robotics students had to modify and programme their robots to manage rubbish recycling and autonomously separate recyclable from non-recyclable rubbish.



Year 10 STEAM

English and Social Studies

Traka, Kaitiaki, The Golden Spirit, and Atalanta are the names of just a few of the superheroes and villains created by our learners this term. Integrating classical mythology and “monsters” in literature, our thematic unit, **Monsters**, involved the students researching mythological creatures, comparing their characteristics and attributes and then creating their own mythical creatures. Students then used online programmes or hand designed their superhero or supervillain. We have also been looking at other types of mythology, mainly Maori mythology and the story of Matariki. Students have created visual representations of the characters in the story of Matariki through mask design.

In English, the students then wrote and presented persuasive speeches, the purpose of which was to convince Marvel or DC Comics to star their mythical creature as the next superhero or villain. We were really impressed with the creative and critical thinking used to develop three dimensional characters and intricate storylines for their audience. Here is a taster for you - the introduction of Sarah Penny's speech:

Our world, is at war with itself. Between sweatshops and school shootings, depression, and racism, destruction appears to be everywhere. And that leaves us wondering; will we ever achieve world peace? Well, Ladies and, more ladies. There is only one magical superhero that, if given her own movie by Marvel, could save the world on and off the screen. She's the Scottish Peacemaker and Haggis-addict you will grow to love. Introducing... The HAGGIECORN!



We also studied Frankenstein and Edward Scissorhands to explore the concept of what it means to be human.

Maths and Science

This term we have been studying Statistics. Statistics deals with the collection, organization, analysis, presentation and interpretation of data. Students worked on investigations based on real data from students in schools all over New Zealand. They had to follow the same process the real statisticians follow in their investigations.

We have learned about different types of data and the best suitable graphs to represent them. Different types of graphs reveal a different aspect of data and it is very important to choose the right one so that valid interpretations and conclusions can be made.

Statistics skills have been applied to an investigation linked to concepts of genetic variation studied in Science. The focus of our investigation is the right handspan length of every Y10 student at our school. We are trying to determine if one or multiple genes control that trait. Currently we have collected most of the data and the next step will be analysis and producing graphs. Then, based on the features of the graphs we will be able to answer our question.

Reproduction and Inheritance in Science

The students are learning how genetic information is passed on through reproduction in plants and animals. This is one of the fundamental concepts in Biology - why genetic variation is important and how it is inherited. Later in Term 4 this information will be linked to the Myths and Monsters term theme to discuss designer babies, the biotechnology behind it and the ethics involved.

Kinetic Sculpture

Kinetic sculpture students aimed to add, extend, reuse and upcycle the construction and materials continuing from the first semester group. The tactile experience gave Students the opportunity to think through the making process to find solutions to creativity, construction methods and functionality.

One of the added challenges to working on one project is collaborating with individuals and negotiating different perspectives. Students were in constant dialogue to reflect, evaluate and redesign the Marble run to find the best solution to joining the components.

"I learnt that a lot of trial and error is needed to create a perfect pinball marble run." Emma Patterson

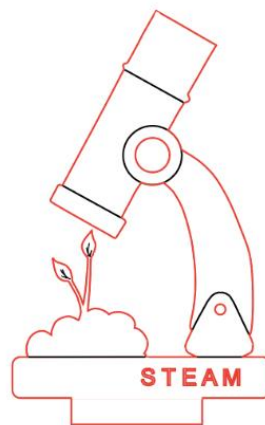
"The highlight of this project was seeing the marble come out the other end because it was like it was finally done." Ariana George



Future Tech

"As part of the Year 10 Future Tech course, we had to make a laser cut design and create an award. Our award is going to be the STEAM award. We brainstormed a whole lot of ideas and finally decided on this design. Our design is a fusion of everyone in our group's designs and shows STEAM as a whole. It shows the technology and science based parts of STEAM. The plant thriving under the microscope represents science and technology, how we thrive in STEAM and grow as people in the STEAM programme. The cloud is a representation of STEAM, showing how we've all grown through the learning we do in the STEAM programme. We have also made the cloud look a little bit like a brain to represent how in STEAM we use a type of learning called a growth mind-set.

On the journey of creating this laser design, we faced many obstacles such as choosing how to fairly incorporate everybody's designs and we also struggled as to the publishing of the design. With our trial cut on the piece of paper, we discovered what we needed to change, having to make the leaf stem thicker. Overall, our design represents STEAM in a very elegant way."



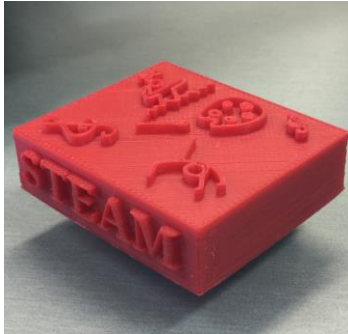
Made by: Abby Tsang, Annabelle Ding and Lily Winchester

"Our challenge was to create a logo that represented aspects of our individual traits. We delivered on this.

Our design is a 'STEAM' book, representing how our team of logo designers met through STEAM,

and that our life stories intertwined when this happened.

The little symbols on the front all represent an aspect of our personalities or something that we are passionate about. We've included a person playing water polo, doing gymnastics, some treble clefs and some art supplies. These things all symbolise our personalities well; what we like to do in our spare time." Grace Chen



Year 10 Community Projects

Students were challenged to use Design Thinking to identify an issue within their community and develop a solution. The issue needed to be one that was meaningful to them and they were then tasked with creating a prototype to minimise or fix it. Encouraging student agency and community engagement, the STEAM projects promote effective teamwork, leadership, problem-solving and innovation. Lily Winchester (10WNP) and Tara Vaughan (10HPT) decided to write and illustrate books for children in their first few years at primary



school. The books explore issues from our local

area - the North Shore - and have augmented reality embedded in them which enhances the reader's interaction with the story. On the 16th of November, Tara and Lily visited a Year 1 class at Takapuna Primary to share their picture books. They really enjoyed the experience of working with other students in the Pupuke Kāhui Ako (Community of Learning).



As part of our STEAM programme here at Westlake Girls High School, students have been working on a community project. They are challenged to use the process of Design Thinking to identify an issue within their community that is meaningful to them, and create a prototype solution to minimise or fix this issue.

Earlier in Term 1, Grace Chen, Rachel An, Hannah Jones and Natalija Hayes began to brainstorm how they would solve the issue of the lack of knowledge about STEAM within our community, the North Shore, especially amongst primary students. This was an issue the students identified based on their research and their own experiences through primary and intermediate schools.

After weeks of preparation and contacting schools we had finalised our solution for our community project issue; to have 30 students from primary schools come into our STEAM workshop to allow primary students from our Kahui Ako to try out various STEAM-based activities and learn more about STEAM as a whole.

Soon weeks became days and we continuously put all our effort into creating this exciting learning environment.

To address their identified community issue, the group has also created a 'STEAM Central' website as a follow up for the workshop participants and to be shared through our Kahui Ako to reach a broader audience. 'STEAM Central' provides information on what STEAM is, giving regular updates on news happening in the tech world and more information about the group members.

On Wednesday 24 October, this idea came to life.

"In our STEAM programme we create opportunities for our students to explore their passions and experience learning in an authentic real-world context," says Hannah, Grace, Natalija and Rachel.

The STEAM workshop has also given primary students some insight into their journey ahead, something to look forward to as they transition through the school system, and positive role models to look up to.

Pictured below from back left: Grace Chen, Hannah Jones, Rachel An and Natalija Hayes with students from Milford and Takapuna Primary Schools



Celebrating 125 years of Women's Enfranchisement



Year 10 STEAM student Sarah Penny (pictured) 1st place winner of the Graduate Women's 125 Year Anniversary of Women's Suffrage Competition. Participants penned letters to Kate Sheppard about the progress towards gender equality over time in our society. The selection committee had this to say about Sarah's wonderful entry:

"Sarah Penny who signed off her letter with the words.. 'a proud young woman' Sarah recognised the need for courage to speak up as the suffragists did in their efforts to achieve suffrage for women and for us all to be aware of the sexism and stereotyping in today's world. There is a challenge to her generation to keep up the good work of Kate Sheppard by putting thought into action in concern for true equality for men and women in New Zealand society."