



STEAMing Ahead

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

Term 1 STEAM Newsletter

Dear Parents and Caregivers,



We are quickly approaching the end of a busy term, and we hope our new termly STEAM Newsletter provides the forum for celebration, reflection and meaningful conversations with the Whanau, around STEAM learning and on the amazing opportunities our students have been involved in, such as the NASA Astronaut Event.

Our Year 9 STEAM students seem to be settled into school life, the STEAM course and are building strong relationships with their peers. The Year 10 STEAM students seem to be in full flow, building on their skills from last year. They are also making the most of the opportunities to experience authentic learning by developing their Community projects and exploring how they can have a real impact by developing innovative solutions to address some of the issues in their community.

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

Some of our STEAM Teachers



Year 9 STEAM

English and Social Studies

Global Citizenship and Human Rights

“You don't make a photograph just with a camera. You bring to the act of photography all the pictures you have seen, the books you have read, the music you have heard, the people you have loved.” — Ansel Adams.

The quote above seems an apt way to start an article about Ida Larsson's visit to our school. Ida is the founder and director of White Lynx photography (<http://www.whitelynxphotography.com/>) and past exhibitor at the Auckland Festival of Photography.



Know Your Rights was the name of her exhibition and the photos within it certainly reflect Ida's passion for social justice and her high level of creativity. There is a photo representing each of the thirty human rights within the Universal Declaration of Human Rights, the

most translated document in the world today.

Ida very kindly gave up her time to come in and speak to our Year 9 STEAM students during their shared English and Social Studies lesson. She discussed the inspiration for each of her images, interweaving many anecdotes and comments about human rights and responsibilities. Students and teachers alike, were impressed with her skill in capturing the essence of humanity in each and every photo. Undoubtedly, Ida's presentation will aid our students in their understanding of global citizenship and the Universal Declaration of Human Rights. Students will be creating static images in English and have a chance to think critically and creatively about the power of symbols and images in conveying a message.

Maths and Science

Design Thinking and Agile Learning

Students are expected to develop good thinking skills using their creativity and curiosity. During their Science and Maths integrated lessons students are applying principles of Design Thinking and Agile methodology to develop their projects ideas.

What is Design Thinking?

Design thinking is an approach to learning that focuses on developing creative confidence. Students engage in hands-on projects that build their empathy, encourages ideation and fosters active problem solving. Using one's imagination is crucial to this process. Through Design Thinking students are challenged to develop solutions to complex real-world problems.

Why do we need Agile Learning?

Agile learning method in the project-based learning and reflective classroom refers to running a class like a development group. This implies that teacher will provide students with practice in agile development, regardless of their subject area and to use agile principles in working together with students to achieve the learning outcomes of the unit of work. In simple terms, the class will be organised and run as a real-life company that deals with developing projects and to ensure that the team meets the goals for each part of the process.

This will allow students to focus on the purpose of their projects and learning outcomes, while at the same time monitoring their organisational skills and

time management. Students will achieve better self-management and importance of meeting the deadlines.

Every project has a 'Kanban board' designed for this purpose and students follow the given flow chart to keep on track with their progress.

Zorb Project: Investigating the motion of an object.



The first project of this year started with “rolling down the plank”!. Students designed an experiment which would replicate the motion of the Zorb to investigate the factors which could influence its motion. Students used different types of balls and a plank to simulate the Zorb movement and collected data. Measuring with accuracy and using the equipment correctly were crucial parts of the project.

To analyse the data collected, students had to organise, calculate and display the results. Many even managed to use Year 10 Mathematic concepts to research the trigonometry ratio and calculate the angle on their own, using the length and the height of the plank! Displaying the data onto different types of graphs of their choice, bar graph, pie chart and/or line graph, helped them to analysis the results by recognising the patterns and draw conclusions. Students then embraced with a full force the challenge of linking their ideas to the concept of Torque, usually taught in Year 13 Physics.

Papertronics and E-Textiles

Students have been exploring the science behind electrical circuitry and paper engineering to develop pop-up books incorporating copper tape, coin cell batteries and LEDs into their design in to enhance the storyline. Students have applied the scientific method to test their circuits and problem solve possible issues with the lighting up of their LEDs.



We were lucky to have guest speaker Donna Cleveland, Lecturer, Researcher and PhD candidate at Auckland University of Technology (AUT), come in to talk about electronic textiles and wearable technologies. Donna showed and

discussed various projects she has been involved in at AUT. This included a dress with sensors that detects the wearer's emotions and lights up in different colours accordingly, and a dress with built-in augmented reality. Donna highlighted the importance of sustainability and explained how she strives to re-use or recycle textiles where possible in her projects. It was inspiring to learn about the ways innovative technologies can be used.

Next term students will learn about sewable circuits and microcontrollers.

Robotics

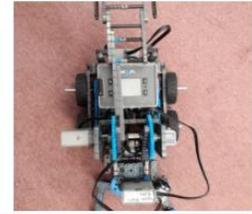
Students have been busy building their robot and commenting all the sensors and motors. Some students are using pliers for the first time and really getting into the mechanics of how a robot works and how gears are used.



Assembling the wheels of the robot



Assembling the brain and the wheels of the robot



Reflection :

"Today, we managed to finish building our robot! It took us about four periods to build it but it was definitely worth it. We got quite frustrated while building the robot because the instructions weren't very clear and the picture was a bit small so we weren't sure where to place the pieces. While we were halfway through another step, we would then realize our mistake and we would have to redo the steps again. I was really proud of group because we were one of the first ones to finish. Our group had really good teamwork and I think that was the key to finish building this robot. Overall, building this robot was enjoyable and I loved it!" Raeanne

Students have been learning the basic skills of programming and apply their learning to make the robot perform specific tasks e.g. The Orchard Challenge, developing their problem solving and resilience skills.

```
// Part 1 (Going around first loop)
2 > forward ( 6.5 , rotations ▾ , 50 );
3 > turnLeft ( 0.7 , rotations ▾ , 50 );
4 > forward ( 2 , rotations ▾ , 50 );
5 > turnLeft ( 0.68 , rotations ▾ , 50 );
6 > forward ( 6.5 , rotations ▾ , 50 );
7 > turnLeft ( 0.7 , rotations ▾ , 50 );
// Transition #1
9 > forward ( 2 , rotations ▾ , 50 );
10 > backward ( 2.5 , rotations ▾ , 50 );
11 > turnLeft ( 0.5 , rotations ▾ , 50 );
12 > backward ( 0.5 , rotations ▾ , 50 );
// Part 2 (Around 3rd loop)
14 > turnLeft ( 0.5 , rotations ▾ , 50 );
15 > forward ( 6.5 , rotations ▾ , 50 );
16 > turnLeft ( 0.6 , rotations ▾ , 50 );
17 > forward ( 2.05 , rotations ▾ , 50 );
18 > turnLeft ( 0.75 , rotations ▾ , 50 );
19 > forward ( 6.5 , rotations ▾ , 50 );
```

Science and Technology

Students are exploring the Scientific and Technological principles involved in the Pop-Pop motor, the simplest form of steam engine. As part of this assignment, they are designing a Pop-Pop boat to race. The boat must be made from reused or upcycled materials.



Yena and Sophie press forming copper sheet to make a dome

To make the motor they have been press forming copper sheet to make a dome which can then be soldered onto a base along with inlet and exhaust pipes. As they work through manufacturing their motors, they have been looking into the physical properties of the materials and how these can be changed through manipulation.



Year 10 STEAM

English, Social Studies and Science

A common interest in our class is the weekly current events quiz. This is a great opportunity for students to test their knowledge on local and global issues and to discuss these in greater detail. Watching the news and reading newspapers will really help students develop their knowledge and understanding, as well as, give them the confidence to engage in meaningful conversations about local and global issues.

It has been a busy term by the end of the term we will have completed the Level 1 Geography Achievement Standard "Describe aspects of a geographic topic at a global scale" worth 3 credits. We have begun by looking at Geographic concepts such as patterns and processes in a practical, hands-on way and working closely with Science.

Through this assessment, we can begin to understand the impacts that volcanic eruptions can have on the lives of individuals and communities. We will also look at the effects that these eruptions have on tourism, infrastructure and the environment.

To align with what the students are studying about our local environment in Social Studies and Science, we have been exploring "Our Place and Our People" through literature in English. This has involved looking at short stories, poetry and song lyrics which reflect aspects of life in New Zealand, and Auckland in particular. Some of you may be familiar with the songs "Verona" by Elemeno P and "Dominion Road" by the Muttonbirds which refer to some of our familiar Auckland landmarks. The final poems we will be analysing are calls to action – showing the impact people have had on our land, flora and fauna. This will lead into students creating their own stories – through prose and poetry.

We have also begun working towards the NCEA Level 1 internal assessment that the students will complete this year. For this assessment, which runs over three terms, students write personal responses to six texts they have read independently.

Authentic learning opportunities

To support their learning, Year 10 STEAM students went on a field trip to study volcanoes in the Auckland Volcanic Zone as part of the Our Place theme for Term One.

Information of the volcanoes, their formation and hazards were useful to tie in the ideas taken learning outside the classroom.

The two main methods of volcano formation were discussed at Lake Pupuke and North Head. Then the students went to visit the Volcano gallery at the Auckland War Memorial Museum – built on yet another volcano – where facts useful for their Science project could be seen in action with the useful exhibits and Volcano House display. The day concluded with a visit to the top of the highest mainland volcanic cone, Mt Eden (Maungawhau), in which the spectacular views afforded of the city allowed everyone to see the many volcanic cones and basins throughout the city.



Students discussing volcano formation at North Head

The day demonstrated how the geological process which shaped the Auckland region has an effect on its people and structures.

Maths and Science

Students looked at mathematical data in a scientific context to explore the use and implications of statistics in supporting scientific research in reaching conclusions as well as the importance of peer review around medical research and implications of valid and invalid correlations.

Students analysed vaccination data, including the use of vaccination to eradicate smallpox in the world to show the impact of societal decisions. A mathematical system of modelling was used to demonstrate potential eradication of childhood diseases in the future. Correlation and causation between sets of data were discussed; and some valid and invalid correlations were presented. In this way, we helped students question data that they may be presented in everyday life, social media and prompt them to consider whether correlations are valid or misleading.

Students then applied what they learn to their own research on whether firstborns are more intelligent than their siblings. They created presentations in which they offered explanations and planned how to collect evidence to test them. Students then pitched their explanation to a “Dragons Den” panel to win funding for their research, collect valid correlations to allow them to prove test their hypothesis.

This activity was designed to show how the scientific method is used by scientists to explain phenomena and solve problems using mathematical data evidence which must be reliable and valid, as only then can accurate conclusions be made.

Kinetic Sculpture



Students will develop problem solving and critical thinking skills as they engage in concepts relating to physics, engineering, sustainable energy and the Arts to develop and create a Kinetic Sculpture. This hands-on approach develops a passion for and gives insight into the diverse applications of the Arts in the real world. Students will also extend their perceptions of reality as prior knowledge by creating their own virtual world by using the amazing “Vive”.

Future Tech



After being inspired by the trip to Massey University, School of Engineering and Advanced Technology students have been busy designing on Onshape and 3D printing their group logos to reflect the character and identity of all group members.



Tara, Victoria and Hannah proud of their accomplishment

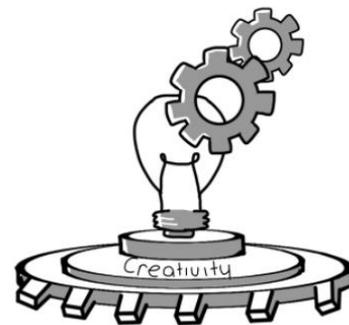
“The trip to Massey was extraordinary! I loved it so much and my eyes were filled with machines and ideas never seen before! It was so interesting to listen to Juan and what he felt like was important to know when trying to invent something new, e.g lots of research! My highlight of the trip was everything it was all so inspirational! However, I absolutely enjoyed him showing us his innovation and motivation towards his cornea idea and hope he has success with it towards the future. I have so many potential ideas to develop in my FUTURETECH! The toys and objects they showed us on the table was

just the beginning of what 3D printers and laser cutters can help us create and make!!!!”- Shella
Please read the whole article by Hannah Jones on the [Voice issue 3](#).

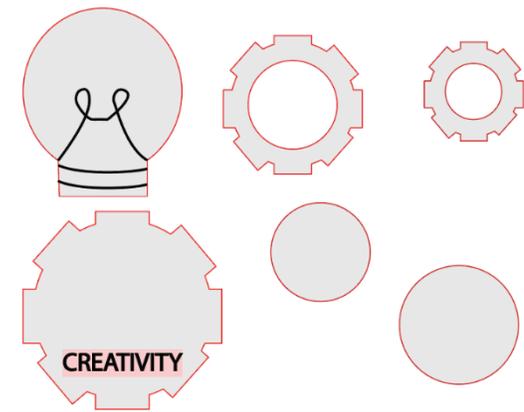
Students have also designed STEAM awards for teachers to award to students whose work reflects, throughout the STEAM program: Innovation, Creativity, Collaboration, Communication, Character, Critical Thinking and Citizenship, very important 21st century skills.

Here is the design for the Creativity Award

Design



Below are the different components designed by the students using Adobe Illustrator to be laser cut.



We are now busy learning how digital games could be used for learning and designing our own games on Gamefoot. Maru NihoNiho visit inspired students to explore the use of gaming to make change in society and to understand principles of game design students will take part in trialling and providing feedback on the game Takaro which is designed to teach young people STEAM skills.



Read Full article by Grace Chen and Sarah Penny on the [Voice Issue 4](#).

Community projects

Year 10 STEAM students are excited by the potential to make a real difference in our community this year. Students are exploring issues within our community to focus on for their community projects. Encouraging student agency, the STEAM projects promote effective teamwork, leadership, problem solving and innovation. The students are working in small groups over the next three terms to develop a project based on their strengths and passions. They will have to come up with a technological innovation as a solution to their community issue.

The first step was to map our community through images and words - issues that concern them, special aspects that need to be preserved and what they love. These images and stories were shared on our project days. Their next steps will be to create action plans and begin making links to people within our community who can support them with their projects. We are impressed by the range of issues that the students have chosen to explore further. These include:

- Traffic congestion around our school
- Educating other students about the importance of STEAM
- Animal cruelty
- Litter and recycling
- Isolation of the elderly
- Water danger
- Water pollution
- Child poverty

- Homelessness We intend to liaise with the organisation such as Future in Tech (<https://www.futureintech.org.nz/>) to make links with industry and recruit mentors for the students to support their big ideas. If you can support us in any way with the projects, please email Ms Dezoete adezoete@westlakegirls.school.nz

NASA Astronaut, Mike Hopkins visit



<https://www.stuff.co.nz/auckland/102966684/nasa-astronaut-encourages-young-women-into-stem-careers>

I cannot think of a more inspirational way of ending the term but for Astronaut Mike Hopkins and Westlake Alumnae and GirlBoss NZ founder, Alexia Hilbertidu, to deliver an out of this world workshop to reinforce and encourage young women into STEM careers.

Westlake Girls was the only school Mike spoke at during his short visit to New Zealand and during his talk to students, which included 100 students from nearby schools, Mike spoke highly about some of the inspirational women he works with at NASA and he reinforced the importance of Science, Technology, engineering and Maths subjects (STEM) and inspired our young women into STEM fields. From growing up on a farm in Missouri, to living on the International Space Station for six months, Colonel Hopkins emphasised the importance of following your dreams, no matter how unrealistic they may seem. When asked what advice he would give anyone wanting to be an astronaut, he replied "Go for it!"

Please read more on this inspirational event on the [Voice Issue 5](#) and on [Stuff/North Shore Times](#).