 Create a maker space

Creation of a maker space and STEM challenge unit

Summary

Students will:

* develop skills in design thinking, applying the processes of ‘Working Technologically/Scientifically’ by planning and conducting a range of investigations
* develop interest and informed values and attitudes towards science and technology and the relationship with mathematics and engineering
* recognise the importance and relevance of science and technology and mathematics in their lives now and for their future
* use the knowledge and skills gained through challenges to take part in the Digital Sparks design technology expo.

[Science (incorporating Science and Technology K-6) K-10 Syllabus](http://syllabus.nesa.nsw.edu.au/science/science-k10/) © NSW Education Standards Authority (NESA) for and on behalf of the Crown in right of the State of New South Wales, 2012.

Staff will:

* focus on assessment for learning and student self-assessment through goal setting, assessment of collaborative practice, creative processes, problem solving and presentation skills
* enhance capabilities through collaborative practice and professional learning to facilitate 21st Century Learning outcomes.

Program overview

Introduction of a ‘Maker Space’. To develop a project/inquiry based learning culture among the students and staff. To give students the knowledge and skills to use innovative technology and tools. Intended to develop students’ understanding of working scientifically/mathematically and the role technology plays in real world applications. To create community/school relationships through the promotion of STEM. To provide an opportunity for all students to succeed through innovative differentiated teaching and learning.

Driving question/hook

How can we use technology to create things and solve real world problems?

| Milestones | Description of event/process/activity/program | Resources |
| --- | --- | --- |
| STEM identified as an area for curriculum development in the School Plan. | Milestone created from data analysis.  All students will be innovative, engaged and successful learners.  Staff will be high performing, collaborative and dynamic. | school plan - analysis of data |
| Established a STEM Team. | STEM Team attended Stage 3 STEM Project Conference in Sydney  Enhanced teacher collaboration. Teachers set STEM goals in their PDPs. | Google Classroom setup for STEM Team collaboration. post of professional readings, resource ideas, maker space examples. |
| STEM Project Plan | Clear vision for STEM project established. ‘Creation of Maker Space’. Stakeholders understanding of process to be followed and evaluative thinking used to track progress.  STEM teacher network established and teacher skill base increased. Regular STEM team meetings for ongoing evaluation and implementation of project. | Project Milestone 1. Google Apps. |
| Students surveyed on their understanding of STEM. | Students complete survey on understanding of STEM. Data collected as benchmark. |  |
| Introduced coding/ designing K-6 via Scratch, Codacedemy, Tinkercad and Sketch Up Apps. | Teachers up skilled in applications through peer mentoring and PL. Students complete a series of lessons on coding and robotics to understand and apply the language of coding. | sequence of lessons. (Teacher Programs) |
| Run weekend STEM workshops as a “hook”. | Engineer visits the school for a workshop with students and parents. At the workshop, they will see a 3D printer in action. The engineer will explain what each component is and how it works. They will then examine a drone and discuss how it works and what technologies are involved etc. The engineer will talk about the links between real life problems and how these tools were created and why. Career links etc. Second workshop students and parents assemble a 3D printer with the assistance of local engineer.  Awareness of STEM and family involvement in school project raised in students and community.  Link developed with CSIRO Local Scientist. Access to experts. Students aware of how STEM is relevant in the real world. | Scientist/Engineer  3D Printer/Drone |
| STEM Team Leader attended the EduTech Conference. | Maker Space resources assessed and ordered. Leadership capacity, collaborative practice & professional network enhanced, through attending workshops and lectures on STEM implementation. | vacant classroom, Arduino Starter Kits, old computers, 3D printer, storage, tools, furnitiure, recyclables, laptops, Lego Mindstorm, Minecraft Turtles Mod, SparkFun Inventor kits, Little Bits, K'NEX Computer Control, Lego WeDo, ENGINO 100 Model Set with 2 RC Motors & Gears, Snap Circuits Extreme 750, RobotiKits 14-in-1 Solar Kit, Green Science Kit Bundle, Mini DIY Kits, |
| Maker Space. | Maker Space designed, room refurbished, resources set up. Dedicated a School Parliament Portfolio to STEM. These students peer tutor, review STEM apps and have input to MakerSpace design. | working bees, resources |
| STEM lessons. | Introduction to STEM. Stage 3 STEM Unit of work developed, to be implemented in Term 3, 2016. | introduction to STEM unit |

Culminating event

The culminating event/s will be the opening of the ‘Maker Space’ where students and parents will take part in a series of mini STEM challenges at the School Expo. These challenges will involve working with the resources provided in the ‘Maker Space’ to solve problems and create or improve products. Interested staff from neighbouring schools invited to view/explore Maker Space and take part in staff challenges. Students participate in the Digital Sparks Design Technology Expo.

Evaluation

Is the Maker Space up and running? Are teachers using strategies outlined in plan? Has the community engagement been positive? Did parents and students engage in the Expo? Are the students motivated? Have they gained an understanding that learning involves failure? Have teachers collaborated and enhanced practice? Is the project sustainable? Are the challenges in the STEM Unit engaging and providing a link to project based learning?