

Windsor Gardens Secondary College

STEM Education



3-Year Development Plan

2016 – 2018

“In the 21st century, scientific and technological innovations have become increasingly important as we face the benefits and challenges of both globalisation and a knowledge-based economy. To succeed in this new information-based and highly technological society, students need to develop their capabilities in STEM to levels much beyond what was considered acceptable in the past.”
- *National Science Foundation*



Continuous Improvement Cycle:

It is intended that this plan will be developed, implemented and reviewed in coordination with the WGSC Site Improvement Plan. Priorities of the college will be the focus of this strategy.

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Rationale:

Science, Technology, Engineering and Mathematics (STEM) -

The **focus on STEM in schools initiative** from the Australian government emphasize that restoring the focus on STEM subjects in schools is about ensuring Australia's young adults are equipped with the necessary skills for the economy of the future.

Encouraging Windsor students to study STEM based subjects and showing them some of the great careers built on Science, Engineering, Mathematics and Technology will also help secure the nation's future. Starting to build this interest in the primary / middle years will help increase the number of students taking up STEM based subjects / VET programs in the senior years.

Vision Statement:

STEM learning and development at WGSC is innovative, systemic, consistent and congruent with strong links back to feeder schools.

Implementation Plan:

1. Improve young people's foundation skills in STEM

- Increase WGSC presence at local Primary Schools with the specific intent to foster interest and appreciation in STEM
- Increase WGSC input into curriculum at local Primary Schools by offering advice on curriculum and learning activities that foster engagement and interest in STEM
- Increase number of Primary Schools and students who attend WGSC for learning opportunities in both the Technology and Science/Mathematics Faculties

2. STEM teaching (Pedagogy)

- Develop interdisciplinary Inquiry-based units of work using Backwards Design philosophy and TfEL Learning Design Framework or Understanding by Design Framework
- 'Make it enjoyable' through development of STEM challenges, Problem Based Learning Days, competitions, puzzles of the month, celebrate achievements, create STEM podcasts between WGSC and Primary Schools
- **From 2017 introduce** "Adventure Space" lessons for Middle School students. Timetabled lessons for Middle School students to explain areas of interest led by teachers who have identified areas of passion for themselves from which to teach. These would be non-assessed classes with no direct link to an Australian Curriculum outcome but to directly foster appreciation and passion in STEM

3. Improve numbers in Senior School STEM subjects

Whilst increased numbers of students in Senior School STEM subjects are a critical component as evidence of success of the STEM vision, a secondary and equally important consideration is that students in Senior School STEM subjects;

- Consistently remain in higher grade bands
- Consistently reflect positively on their pedagogy
- Consistently employ higher order Blooms Taxonomy and metacognition
- Consistently demonstrate high levels of resilience to challenge

4. Improve critical connections and partnerships

- Create, foster, nurture and respect partnerships with Industry (Parafield Airport etc.) that support opportunities for students to see real-world applications of STEM concepts and careers in the workplace. Also for industry leaders to come to WGSC to discuss their educational journeys and workplace experiences
- Primary schools within the North East and Torrens partnerships
- Pedal Prix enhances students developing engineering skills and problem solving techniques. It takes the form as a Metal Work subject with the prime goal of developing faster vehicles. Designing, making, appraising, problem solving skill development and a better understanding of physic law are all objectives. This also links well with the current Year 9 CO2 dragster course