

## Sustainability: Newcastle Grammar School's rooftop gardens

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### The significance of the program:

- In taking on the responsibility for the stewardship of a number of bee hives, NGS students are able to learn about the pressures these important insects face.
- They see the unique way in which bees construct their home and engage with their local environment to survive.
- The program works in unison with a rooftop farming project as the students harvest food and seed that has been pollinated by the bees.
- From a wellbeing point of view, the program builds a sense of appreciation for the world around them and allows the students to practice mindfulness and flow while working with the bees.
- NGS expects to participate in a biosecurity screening program for varroa mite and other foreign honey bee pests.
- Stage 4 Technology Mandatory students will help care for the garden from 2019 onwards, as part of their agriculture unit of study.
- The obvious cross-curricular link is then with Stage 5 Geography students as they start to investigate Sustainable Biomes and Food Security.

Compared with people living in many countries around the world, most Australians have very reliable access to a wide variety of different foods. Relatively high wages and a strong economy mean that most Australians can afford to purchase and prepare the food they need and rarely worry about where their next meal is coming from. (Collins et al : Oxford Insight Geography Stage 5, OUP 2016)

However, food experts are warning that famines are likely to become more severe and widespread as the Earth's climate changes and the human population continues to grow. An argument is also made that food security is the greatest single issue facing the world today. I would also include the associated water shortages in this debate too.

There are six main threats to food security: water scarcity; climate change; threats from non-native plants, animals and insects; competition for land; the use of land for fuel instead of food; and armed conflict. Although Newcastle Grammar School's (NGS) Roof Top Garden may not be able to resolve these issues, it does go a long way to bringing them to the attention of their students through both, the theory and hands on getting 'down and dirty', still within their concrete-based CBD playground.



# HUMAN ALTERATION & MANAGEMENT



## Role and importance of bees in the environment:

- Bees are the sole pollinator for many of the introduced food plants we rely on.
- Their efforts in pollination contributes to food security by ensuring we can produce locally acclimatised fertilised seeds.
- This extends to non-edible plants also. Many of which rely on insect pollination to reproduce.



## Rooftop garden and beehives create a buzz

NGS is taking learning to the top, with a flourishing rooftop garden opening up new learning experiences across a wide range of subjects, and students abuzz with enthusiasm for two recently established beehives.

Technology teacher Mr Chris Wyatt is leading the project that has not only seen the rooftop turned into a sustainable garden supplying fresh produce, but will foster the growth of Newcastle's bee population.

The rooftop garden was planted for the first time in 2018 and has produced vegetables to be used in Food Technology courses and the school canteen. The first crop was harvested in September last year, with a "mega cabbage" used to make coleslaw served on the baked potatoes being sold in the canteen.

From 2019, Stage 4 Technology Mandatory students will help care for the garden as part of their agriculture unit of study. And composting has also been added to close the energy loop for the garden. There are also plans for the future to have aquaponics incorporated into the garden – a self-sustaining system of growing fish in a symbiotic combination with plants.



# HUMAN ALTERATION & MANAGEMENT

## Bringing cross-curricular links with STEM to life

Newcastle Grammar School has a strong focus on STEM education and a big part of this is looking at the processes around us humans and how energy is produced and utilised. Geography is used as the vehicle.

"The garden offers an exciting opportunity for students to have a real-world connection and one of the ideas already being discussed among students is the possibility to incorporate solar energy into the aquaponic system to run the pumps." Mr Wyatt said students were driving the garden's development, putting forward suggestions about how it is designed and what elements are incorporated.

"This project will help bring learning to life across a wide range of subjects, which we know provides students with skills that are not only critical to supporting future innovation in Australia, but are increasingly sought by employers regardless of the career pathways students pursue," Mrs Erica Thomas (Head of School).



## NGS beekeeping programme has no sting in the tail

NGS students are now the proud carers of colonies of stingless bees, after two hives were installed on the rooftop of the city based Hill Campus. "We certainly need to protect our native bees, which face the threat of loss of habitat," Mr Wyatt an avid apiarist says. The students are managing the hives, which have a perspex lid enabling close monitoring of their development.

Beekeeping not only provides students with new experiences and skills, but can teach them how to work towards a goal, how to work in collaboration and show them the value of contributing to their community. The programme is in keeping with the school's Positive Education Framework, beekeeping and gardening were also great stress-relievers, encouraging mindfulness and focus.

"I have a passion for students learning self-sufficiency, but I think the most powerful aspect is really about student wellbeing. Students have the opportunity to interact with the environment, to slow down, and to take time to appreciate what is around them." Mr Wyatt says.

A parent wrote "What a great privilege to have such passionate teachers who want to share their skills, hobbies, knowledge and passion with the students and school community beyond their role as classroom teachers."

Maybe rooftop gardens and bee hives are a step too far for you as a Geography teacher. But what about a simple project like growing plants in recycled terrariums on your classroom windows? Or using old car tyres with some simple herbs or vegies in the corner of your playground? Maybe even revegetate your school pathways or roadside verge? Is cost a concern? Approach one of your local businesses and ask for an 'investment in educating local students'. Get involved and dirty!

Abstracts taken from Oxford Insight Geography Stage 5 (Collins et al, OUP, 2016) and Chris Wyatt (STEM Teacher, Newcastle Grammar School). Photos taken by Drew Collins and Chris Wyatt

