

Young Scholars Project

Global Innovators Challenge Overview

Goals

USC's Young Scholars Project has developed a 'Global Innovators Challenge' module which aims to:

- Encourage students to develop skills in the process of inquiry, literature research, experimental investigation and critical thinking
- Inspire and challenge students to extend their learning in science
- Facilitate collaborative learning
- Promote a critical and action-based approach to problem solving and design thinking
- Encourage a global citizenship approach with students, considering vital questions about global challenges
- Provide opportunities to gain advice and tips from 'real' experts in the field
- Promote collaboration between USC and local secondary schools

The module builds upon one or more concepts within the Australian Science Curriculum. Modules are not designed to replace content in the learning sequence of an Australian Curriculum unit. They are extension resources that students engage with alongside the learning sequence and assessment tasks of an existing unit.

Project Approach

The challenge is embedded in an Immersive Day held at the USC campus where students engage and interact with USC academics and students. The concept of the Global Innovators Challenge was developed by Engineers without Borders, and has been adapted from a University level project to a suit a more generic audience such as a Year 9 Science class.

In the first part of the day, students take part in a series of STEM-based hands-on activities which relate directly to the issues faced by people in the developing community of Bambui, Cameroon. The day culminates in a strategic planning session where students take on the roles of various STEM professionals, charged with the responsibility of coming up with solutions to Bambui's issues using STEM.

The challenge activities contribute towards the development of skills in problem solving, the application of basic science, health and engineering fundamentals, and communication. The challenge uses science and technology to address global issues such as energy, water and food. It gives students a real insight into how **science and technology can be used to tackle challenges faced by communities in the developing world**, and how they can be part of the solution.

Content Overview

Bambui is a rural community in the north-west region (English speaking region) of Cameroon that is undergoing rapid urbanisation following the construction of a new university in the last 8 years. This rapid urbanisation is increasing the pressure on the existing water supply, sanitation, waste management and housing facilities available.

The activities that students take part in during the Immersive Day will illuminate specific challenges that the Bambui population face due to lack of robust physical infrastructure and a clearly articulated vision to navigate the rapid population growth. It is anticipated that these activities will give the students a new insight into how STEM can be used to collaborate with developing communities to facilitate sustainable growth and alleviate poverty and disease.

Young Scholars Project website

The **Student Space** of the [Young Scholars Project](#) website has been designed by USC curriculum developers to house YSP-specific material, as well as valuable resources for assignments, tips on how to research and reference, and strategies for successful teamwork.

For the Global Innovators Challenge, go to <https://youngscholarsproject.edu.au/year-9-global-innovators-challenge/> to find:

- Background information on Bambui
- Bambui Locations resource kit
- Mini-challenge resource kits on Disease, Water, Sanitation and Hygiene
- Videos of interviews with **Experts in the Field** of STEM

There are 6 distinct locations in the simulated Bambui environment that students can investigate as part of the challenge:

1. **Streams** – *water supply, sanitation and hygiene, waste management*
2. **Public toilets** – *sanitation and hygiene*
3. **Houses** – *water supply, sanitation and hygiene, food (dehydrating and preserving), energy, urban planning/infrastructure*
4. **Markets** – *food, waste management*
5. **Rubbish Dump** – *water supply, waste management*
6. **Farms** – *food, climate change, plant disease*

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Australian Curriculum Links

The module has been written to align to and promote deeper learning within the Australian Curriculum: Science, but also has relevant touchpoints across the wider curriculum, including Humanities and Social Sciences, Design and Technologies, and Economics and Business.

Australian Curriculum: Science

Science as a Human Endeavour

Nature and development of science

Scientific understanding, including models and theories, is contestable and is refined over time through a process of review by the scientific community

- considering how ideas about disease transmission have changed from medieval time to the present as knowledge has developed
- investigating how models can be used to predict the changes in populations due to environmental changes

Use and influence of science

People use scientific knowledge to evaluate whether they accept claims, explanations or predictions, and advances in science can affect people's lives, including generating new career opportunities

- considering the impacts of human activity on an ecosystem from a range of different perspectives
- recognising aspects of science, engineering and technology within careers such as medicine, medical technology, telecommunications, biomechanical engineering, pharmacy and physiology

Values and needs of contemporary society can influence the focus of scientific research

- considering how choices related to the use of fuels are influenced by environmental considerations

Science Inquiry Skills

Questioning and predicting

Formulate questions or hypotheses that can be investigated scientifically

- developing ideas from students own or others' investigations and experiences to investigate further
- using internet research to identify problems that can be investigated

Processing and analysing data and information

Use knowledge of scientific concepts to draw conclusions that are consistent with evidence

- suggesting more than one possible explanation of the data presented

Evaluating

Evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data

- identifying alternative explanations that are also consistent with the evidence

Critically analyse the validity of information in primary and secondary sources and evaluate the approaches used to solve problems

- describing how scientific arguments are used to make decisions regarding personal and community issues

Communicating

Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations

- using the internet to facilitate collaboration in joint projects and discussions
- presenting results and ideas using formal experimental reports, oral presentations, slide shows, poster presentations and contributing to group discussions

Australian Curriculum: Design and Technologies

Design and Technologies Knowledge and Understanding

Explain how products, services and environments evolve with consideration of preferred futures and the impact of emerging technologies on design decisions

- recognising real-world problems and understanding basic needs when considering designed solutions, for example Engineers Without Borders High School Outreach Program allows students to design solutions to problems in a country in Asia

Design and Technologies Processes and Production Skills

Evaluate design ideas, processes and solutions against comprehensive criteria for success recognising the need for sustainability

- establishing specific criteria for success for evaluating designed solutions
- reflecting on learning, evaluating processes and transferring new knowledge and skills to future design projects

Australian Curriculum: Humanities and Social Science > Geography

Unit 1: Biomes and food security

Challenges to food production, including land and water degradation, shortage of fresh water, competing land uses, and climate change, for Australia and other areas of the world

Unit 2: Geographies of interconnections

The way transportation and information and communication technologies are used to connect people to services, information and people in other places

Australian Curriculum: Economics and Business

Economics and Business Skills

Economic reasoning, decision-making and application

- Generate a range of viable options in response to an economic or business issue or event, use cost-benefit analysis and appropriate criteria to recommend and justify a course of action and predict the potential consequences of the proposed action