BLUE SEA THINKING

Have you ever heard the term "Blue sky thinking"? This refers to thinking creatively to find new ideas, without restrictions and the sky is literally the limit. However, since we are all about education on the coast, we are going to challenge your Blue Sea thinking with this innovative design project.

Innovation Design Guidelines

Your challenge is to design a new innovation that would help manage, prevent and/or remove a major environmental issue affecting a coastal ecosystem.

The following activities have been created to help you identify the different important elements which need to be considered and included in your design.
The resource list on page 5 will assist further with your research.

1. Where will this innovation be implemented?

Before you begin with your design, let's decide where your innovation will be used. The following is a list of coastal environments that are often placed under threat. Choose one or more to focus on in this activity

Sample Coastal Environment List
• A coastal place in your region
• A favourite coastal place you have or would like to visit
• Open ocean
• Beachfront
• Rocky platform
• Intertidal zone
• Reef
• Mangrove
• Estuary
• Dune system

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2. What environmental issue/s will your innovation target? Why did you choose these issues?

Below is a list of common threats to environments around the world. Research the coastal environments you have chosen to find out what issues your design innovation will prevent

Climate change - Habitat loss - Invasive species – Pollution - Poaching

Use this list and the questions below to help you create a mind map, identifying the main environmental issues impacting your chosen coastal environment. Could your innovation focus on more than one of these?

Mind map questions:

- What are the big environmental **issues** impacting your coastal environment?
- **Who/what** is causing these environmental issues? Is there any overlap between causes and impacts?
- **How** does the impact negatively affect the coastal environment?
- **Where** is the impact effecting the coastal environment? Eg. sand, dunes, water
- **When** does this impact occur? Is it year-round or seasonally?
- What **solutions** can you think of for each problem?
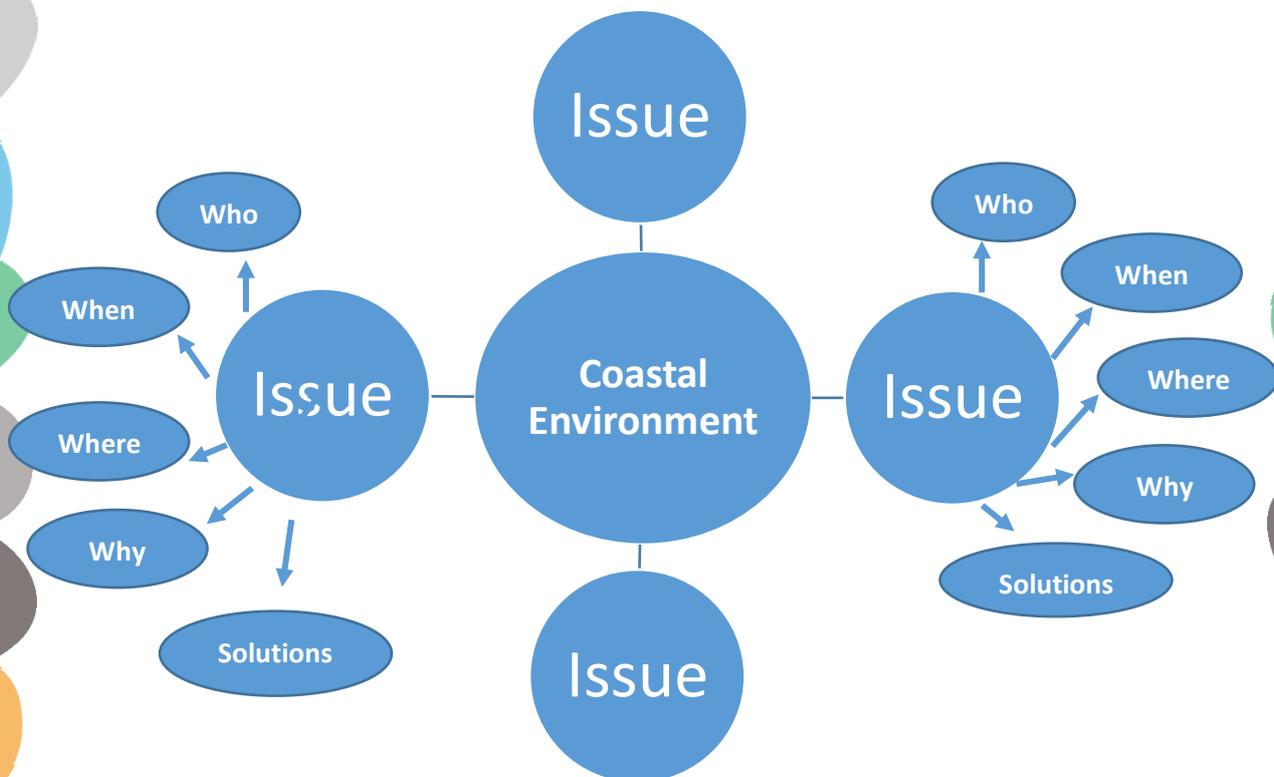
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3. Identify your stakeholders

Will your innovation involve protected areas such as marine parks, or require new skills or behaviours by people using the area? And who will create, maintain and implement the innovation? It's important to know who utilises and manages the area and their needs, wants and legal requirements. Coastal areas have a range of stakeholders or people who access and utilise them for a variety of reasons. These include but are not limited to:

- Traditional owners of the land who are culturally and spiritually connected to the land
- People who access these areas for recreation such as surfing or dog walking
- Commercial sector which rely on tourism on and near the coast for income
- Volunteer and conservation groups who aim to maintain environmental values
- Local, State, Federal and International organisations legally responsible for the management of a variety of coastal environments

How would you like your innovation to impact on the stakeholders of the area ? Make a list, identifying the potential benefits and negative impacts on each stakeholder as a result of your innovation.

Stakeholder	Positives/Benefits	Negatives/Disadvantages

4. How will your innovation address the triple bottom line?

The triple bottom line refers to the *social*, *economic* and *environmental outcomes* for a plan or design. This is an important idea to consider, as it makes us think deeper about how to create solutions that include benefits not only for the environment, but also the welfare of people and communities living there and in turn their livelihood.

Use a Venn diagram to identify the social, economic and environmental outcomes of your innovation. By doing so, you can improve the potential success of your innovation by including the needs and wants of each area in the process.

Social

Environmental

Economic
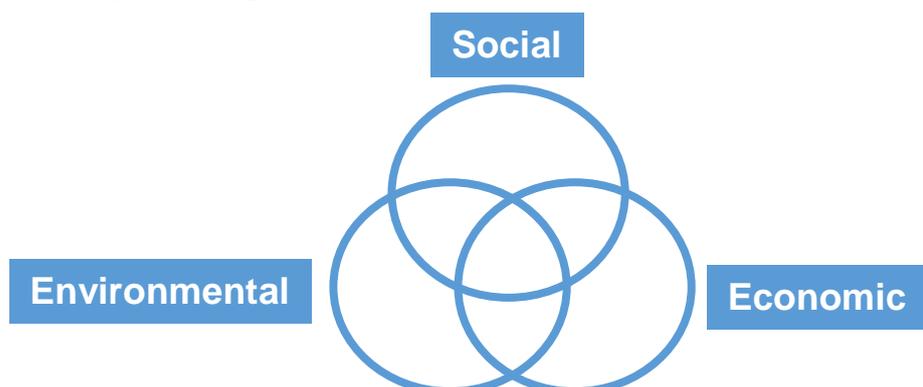
5. Start innovating!

Now it's time to get innovating! Using the information you have gathered from the activities above, make sure to include the following information in your design.

- Where your innovation will be used
- What environmental issue/s will your innovation help with
- Why you chose this issue
- What social and economic impacts will your innovation have locally
- Who will be involved in creating, managing, implementing your innovation
- Who will benefit or be disadvantaged by your innovation

You can choose to create and present your innovation in any way you wish. See below for some ideas:

- Annotated 3D model
- Detailed blue-print
- Audio/visual presentation
- Brochure
- Info-mercial
- Short movie
- Combination of the above

See below extra links for inspiration.

Happy innovating!

Three innovative initiatives for cleaning up the oceans

#social action   #nature   #environmental sustainability

According to Greenpeace, our oceans receive 200 kilos of rubbish a second and have floating islands of plastic with an area four times the size of California. This situation, which is so harmful to the health of our planet, has inspired three ingenious initiatives for cleaning up the oceans. Read about them here; they'll definitely surprise you!

https://www.iberdrola.com/environment/ocean-cleanup-initiatives

12 robots that could make (or break) the oceans

https://www.weforum.org/agenda/2016/09/12-cutting-edge-technologies-that-could-save-our-oceans/

Inventions or Innovations to Clean the Ocean
FEB 12, 2019

https://cheapestloadofrubbish.com.au/articles/rubbish-removal/inventions-or-innovations-to-clean-the-ocean/

7 Inventions That Are Literally Saving Our Oceans

From a toothpaste in a pill to a giant Pac-Man device that eats up plastic, these innovations are saving our oceans from the plastic waste that plagues them.

By Loukia Papadopoulos
February 22, 2019

https://interestingengineering.com/7-inventions-that-are-literally-saving-our-oceans

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Online Resources

Coastal Land Management & Community Engagement

GORCC (Great Ocean Road Coast Committee)
https://www.gorcc.com.au/
https://www.gorcc.com.au/about-us/our-work/
https://www.gorcc.com.au/project-status/current/
https://www.gorcc.com.au/about-us/plans-and-reports/
https://www.gorcc.com.au/projects/point-grey-lorne-redevelopment/

GORCPA (Great Ocean Road Coast and Parks Association)
https://engage.vic.gov.au/great-ocean-road

Engage Victoria

https://engage.vic.gov.au/consultations

DELWP (Department of Environment, Land, Water and Planning)

https://www.marineandcoasts.vic.gov.au/marine-and-coastal-act

Parks Victoria

https://www.parks.vic.gov.au/get-into-nature/community-engagement

Bang the table: digital engagement
https://www.bangthetable.com/

Common cause foundation
https://valuesandframes.org/

Inspiring innovations and campaigns

21 Sustainability Innovations and Initiatives That Might Just Change the World
https://interestingengineering.com/21-sustainability-innovations-and-initiatives-that-might-just-change-the-world

The 10 Best Environmental Innovations of 2015! Planet Editor
http://www.planetexperts.com/the-10-best-environmental-innovations-of-2015/

Top 10 : Innovations for the future of the ocean
https://medium.com/impossible/top-10-innovations-for-the-future-of-the-ocean-6d7b877a0bf0

Sticky pronk surf wax
https://www.abc.net.au/news/2018-12-30/meet-the-kid-who-has-launched-an-eco-friendly-surf-wax-company/10672450

Straw no more
https://www.strawnomore.org/

Plastic Free Sophia
https://www.plasticfreesophia.com/bio#intro

5 out-there inventions to clean the world's oceans
https://www.redbull.com/au-en/ocean-cleaning-inventions

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Teachers Notes & Curriculum Links

This resource has been designed for students from Year 7 – VCE. It can be completed as individual tasks or one complete project. Students may complete individually or in small groups. Teachers may wish to add a final presentation or viewing of innovations with a class vote for the most innovative, well designed, etc. Guest speakers from the environmental fields may also be invited to judge final products. We hope your students enjoy and find this activity meaningful, and we would appreciate any photos, details or links to students work to inspire others. These can be sent to our Education team at education@gorcc.com.au .

VICTORIAN CURRICULUM LINKS

YEARS 7 & 8

Geography	Elaborations
Factors that influence the decisions people make about where to live and their perceptions of the liveability of places (VCGGK111)	- investigating their and others' interpretations of the concept of liveability and why what makes a place liveable may vary from person to person according to age, education, income, cultural background and other variables - comparing student access to and use of places and spaces in their local area and evaluating how this affects perceptions of liveability - discussing why many Aboriginal and Torres Strait Islander peoples live on their Country/Place or might prefer to if they had the choice
Influence of accessibility to services and facilities; and environmental quality, on the liveability of places (VCGGK112)	- comparing accessibility to and availability of a range of services and facilities between different types of settlements (urban, rural and remote) in Australia and other countries. For example, shops, access to clean water, sanitation, education and health services - examining the role transport plays in people's ability to access services and participate in activities in the local area - explaining the importance of water quality to the liveability of places - investigating the concept of environmental quality and surveying the environmental quality of their local area and its effect on liveability - exploring the geomorphology of the land and how this affects the liveability of a place
Environmental, economic and social measures used to evaluate places for their liveability, comparing two different places (VCGGK113)	- comparing objective measures of liveability such as transportation infrastructure, with subjective measures such as people's perceptions - comparing two liveability surveys and how this affects ranking places - evaluating surveys of liveability and the measures they use
Influence of social connectedness and community identity on the liveability of places (VCGGK114)	- discussing the different types of places where people and groups can feel included or excluded, safe or threatened, and evaluating how this affects perceptions about liveability of places - investigating the extent to which people in their place are socially connected or socially isolated and its effect on liveability
Strategies used to enhance the liveability of places, especially for young people, including examples from Australia and Europe (VCGGK115)	- researching methods implemented in Australia and Europe to improve the liveability of a place, and evaluating their applicability to their own locality - developing a specific proposal to improve an aspect of the liveability of their place, taking into account the needs of diverse groups in the community, including, for example, young people through fieldwork in the local recreation area or Traditional Owners by developing bilingual signage or indigenous garden projects - discussing the impact of increasing housing density on the liveability of places, and on their environmental sustainability

YEARS 7 & 8 continued

Design and Technologies	Elaborations
Investigate the ways in which designed solutions evolve locally, nationally, regionally and globally through the creativity, innovation and enterprise of individuals and groups (VCDSTS044)	- exploring how designed solutions have changed over time and predicting future developments, for example home entertainment, communications or food packaging - considering the rights and responsibilities of those working in design and technologies occupations, for example consideration of Aboriginal and Torres Strait Islander protocols - exploring the use and development of systems for navigating unfamiliar environments, for example a service to help tourists engage with a heritage area - investigating traditional and contemporary design and technologies, including from Asia, and predicting how they might change in the future in response to factors such as social change and the need for more sustainable patterns of living - identifying needs and new opportunities for design and enterprise, for example promotion and marketing of designed solutions - investigating how developments in materials, tools and equipment influence designed solutions

YEARS 9 & 10

Geography	Elaborations
Environmental, economic and technological factors that influence environmental change and human responses to its management (VCGGK145)	- identifying human-induced environmental changes, such as water and atmospheric pollution, loss of biodiversity, degradation of land, inland and coastal aquatic environments, and evaluating the challenges they pose for the sustainability of environmental functions - evaluating the concept of ecosystem services and the importance of these services for sustainability of biodiversity - discussing whether environmental change is necessarily a problem that should be managed - proposing geographical management strategies for the environmental change being investigated, for example, establishing reserves and corridors to preserve biodiversity (a spatial strategy), ecosystem-based management (an environmental strategy), urban planning to reduce energy consumption (a spatial strategy), and addressing the underlying as well as immediate causes of environmental change (holistic thinking) - applying the concept of place to explain the variety of strategies and solutions to similar environmental changes in different places
Environmental worldviews of people and their implications for environmental management (VCGGK146)	- describing the role of people's environmental worldviews, for example, human-centred and earth-centred, in producing different attitudes and approaches towards environmental management - comparing the differences in people's views about the causes of environmental issues in Australia and across the world - explaining people's choices of methods for managing or responding to environmental changes - discussing the influence of people's world views on programs for the management of the environmental change being investigated

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YEARS 9 & 10 continued	
Geography	**Elaborations**
Aboriginal and Torres Strait Islander peoples' approaches to custodial responsibility and environmental management in different regions of Australia (VCGGK148)	• describing the role of people's environmental worldviews, for example, human-centred and earth-centred, in producing different attitudes and approaches towards environmental management • comparing the differences in people's views about the causes of environmental issues in Australia and across the world • explaining people's choices of methods for managing or responding to environmental changes • discussing the influence of people's world views on programs for the management of the environmental change being investigated
Application of environmental economic and social criteria in evaluating management responses to an environmental change, and the predicted outcomes and further consequences of management responses on the environment and places, comparing examples from Australia and at least one other country (VCGGK149)	• explaining how communities and governments attempt to balance environmental, economic and social criteria in decisions on environmental programs, and the extent to which there can be trade-offs between them • debating the practical and ethical dilemmas of national and international conservation programs aimed at the environmental change being investigated
Apply design thinking, creativity, innovation and enterprise skills to develop, modify and communicate design ideas of increasing sophistication (VCDSCD061)	• using techniques including combining and modifying ideas and exploring functionality to generate solution concepts • undertaking functional, structural and aesthetic analyses of benefits and constraints of design ideas, for example to different communities and environments including those from the countries of Asia • re-imagining designs to feature emerging technologies • considering competing variables that may hinder or enhance project development, for example weight, strength and price; laws; social protocols and community consultation processes • producing drawings, models and prototypes to explore design ideas, for example using technical drawing techniques, digital imaging programs, 3D printers or augmented reality modelling software; producing multiple prototypes that show an understanding of key aesthetic considerations in competing designs • communicating using appropriate technical terms and recording the generation and development of design ideas for an intended audience including justification of decisions, for example developing a digital portfolio with images and text which clearly communicates each step of a design process

VCE	
Outdoor and Environmental Studies	**Elaborations**
Unit 1 – Exploring outdoor experiences Area of Study 2 (Outcome 2) – Experiencing outdoor environments	• the variety of ways in which people experience and respond to outdoor environments, for example as a resource, for recreation, for adventure, for spiritual connection, and as a study site • the different ways of knowing outdoor environments, including through experiential knowledge, environmental and natural history, and ecological, social and economic perspectives
Unit 2 – Discovering outdoor environments Area of Study 2 (Outcome 2) – Impacts on outdoor environments	"…In this area of study students focus on human activities undertaken in outdoor environments and their impacts on those environments. Although environmental impacts include both natural and human induced changes on components of the environment, the focus here is on human impact – both positive and negative..."
Unit 3 – Discovering outdoor environments Area of Study 1 (Outcome 1) – Historical relationships with outdoor environments Area of Study 2 (Outcome 2) –increasing population – industrialisation – nation building	• an overview of Australian outdoor environments before humans, including characteristics of biological isolation, geological stability, and climatic variations • relationships with Australian outdoor environments expressed by specific Indigenous communities before and after European colonisation • relationships with Australian outdoor environments as influenced by: – the first non-Indigenous settlers' experiences – increasing population – industrialisation – nation building
Unit 4 – Sustainable outdoor relationships Area of Study 1 (Outcome 1) – Healthy outdoor environments Area of Study 2 (Outcome 2) – Sustainable outdoor environments	"In this unit students explore the sustainable use and management of outdoor environments. They examine the contemporary state of environments in Australia, consider the importance of healthy outdoor environments, and examine the issues in relation to the capacity of outdoor environments to support the future needs of the Australian population…