Griffith UNIVERSITY
Centre for Coastal Management

COASTED

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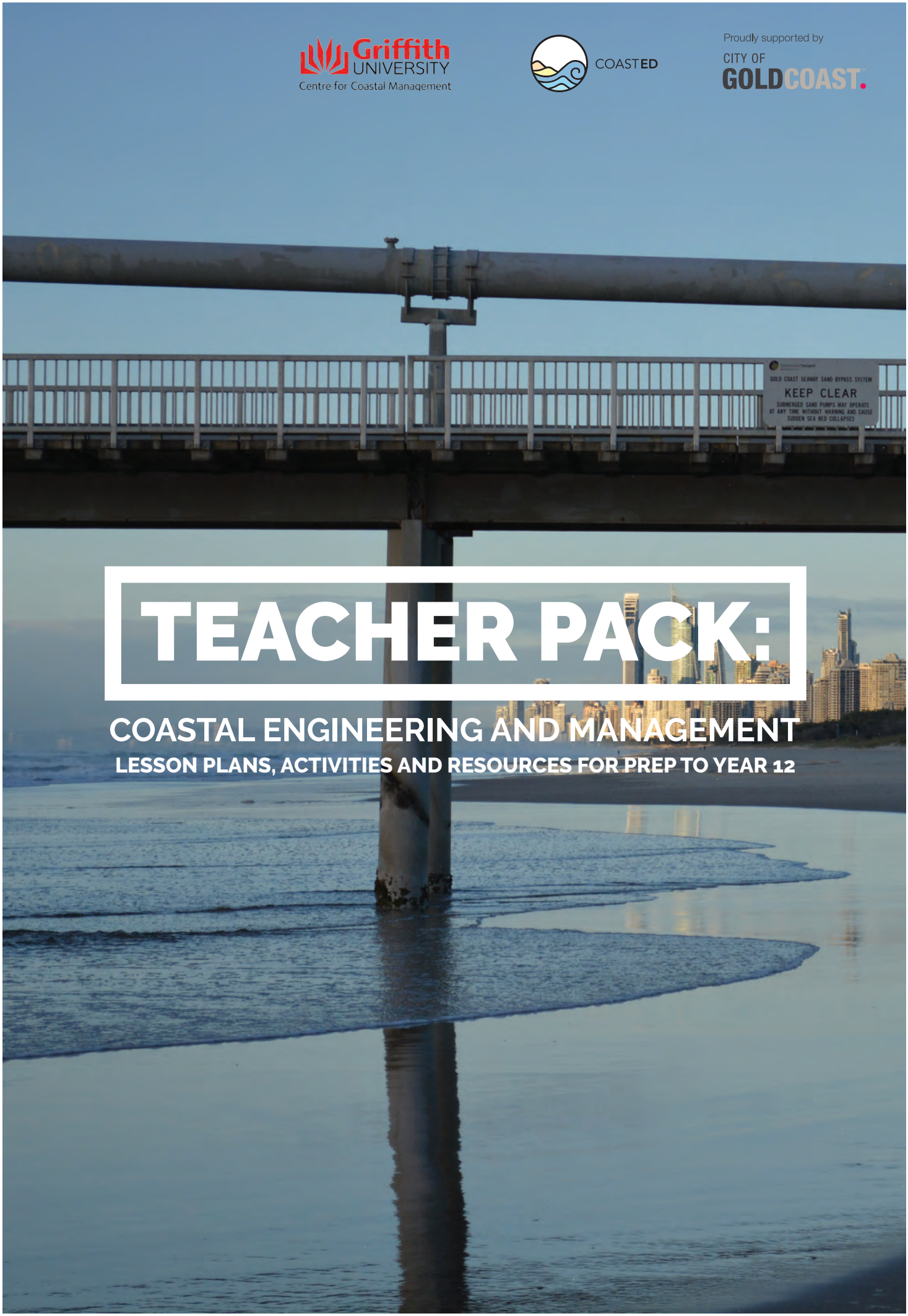

TEACHER PACK:

COASTAL ENGINEERING AND MANAGEMENT

LESSON PLANS, ACTIVITIES AND RESOURCES FOR PREP TO YEAR 12

ACKNOWLEDGEMENTS

This teacher pack on Coastal Management and Engineering was produced by the Griffith Centre for Coastal Management's CoastEd program in collaboration with the City of Gold Coast.

The Centre would like to acknowledge the assistance of the following people in the creation of this pack:

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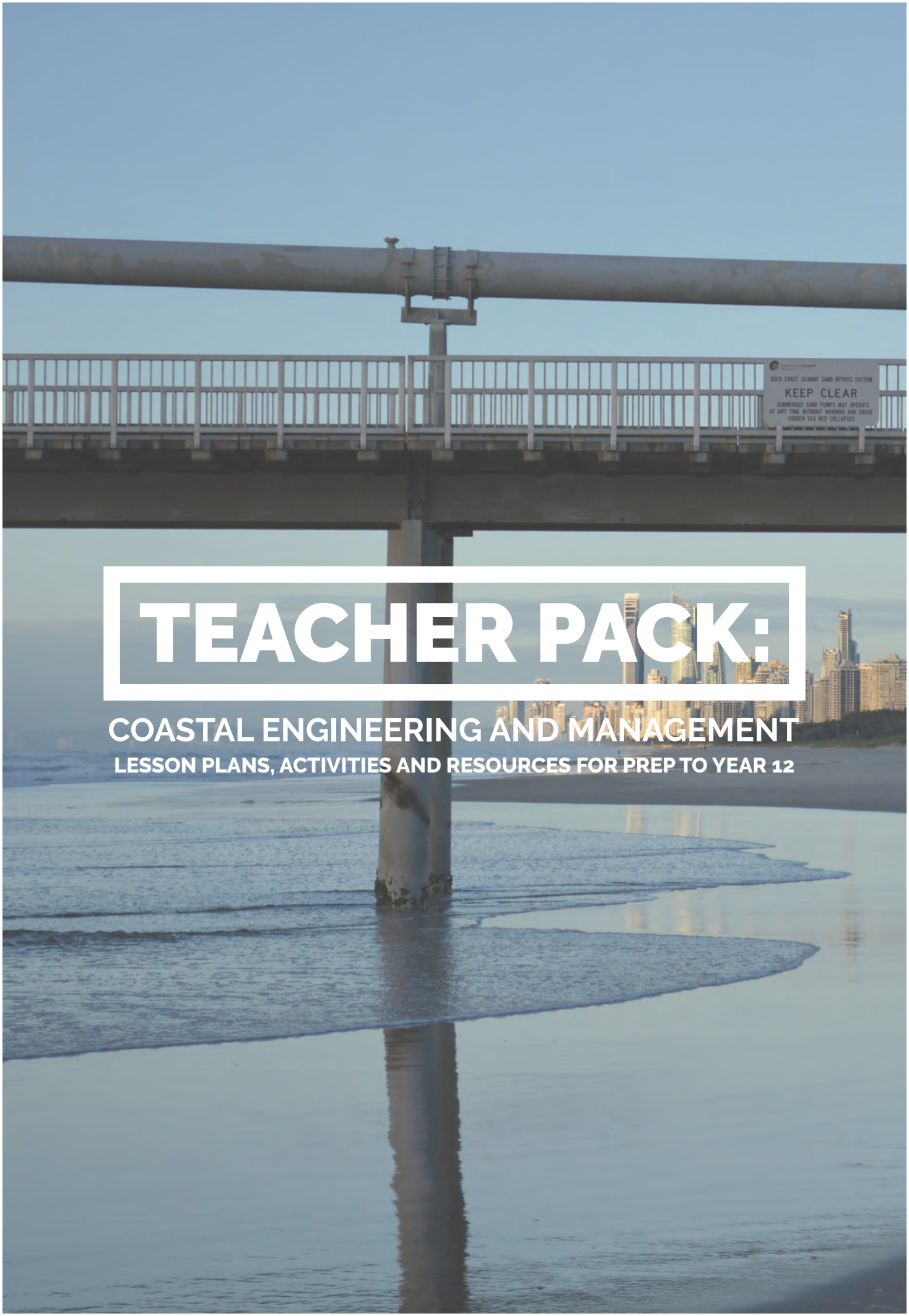
Graphic design: Zoe Keidge

ISBN 978-1-925455-09-0 for Teacher Pack: Coastal Management and Engineering : Lesson plans, activities and resources for prep to year 12.



TEACHER PACK:

COASTAL ENGINEERING AND MANAGEMENT

LESSON PLANS, ACTIVITIES AND RESOURCES FOR PREP TO YEAR 12

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WELCOME

TO COASTED'S **COASTAL ENGINEERING** TEACHER'S PACK

In this pack you will find a range of ideas, activities, resources and lesson plans, designed to allow you to engage students on the topic of **Coastal Engineering**, facilitate learning and maximise understanding of natural coastal processes and management strategies for the local beaches, foreshores and dunes on the Gold Coast. Resources are created for targeted year groups and include clear curriculum links.

Coastlines are dynamic environments, constantly changing as a result of coastal processes and varying weather patterns. Under calm conditions, the sand may shift just a millimetre or so and during an extreme storm event, beaches can change rapidly as sand is moved offshore. Historically, storm events have driven innovation in coastal engineering in order to protect our city. However, as population has grown on the Gold Coast, so too has development along our beaches. A range of coastal management techniques are being implemented across the Gold Coast to meet the varying challenges faced by each area, depending on environmental conditions and the extent of development.

The resources in this pack allow you and your students to explore **Coastal Engineering** on the Gold Coast, through engaging and thought provoking activities.

ABOUT COAST**ED**

CoastEd is an award winning education program for schools and community groups. It provides the opportunity to learn about our precious coastal areas from qualified environmental scientists and industry professionals. In curriculum based sessions, students take part in activities such as building a beach, dune surveys and beach health surveys. The CoastEd program seeks to provide valuable information and resources to schools and the community as well as increasing the capacity of the Gold Coast community to participate in coastal management through increased awareness and participation.

THE GRIFFITH CENTRE FOR COASTAL MANAGEMENT

The Griffith Centre for Coastal Management aims to develop broad research and training agendas for coastal management. The centre works in partnership with the City of Gold Coast, who has funded the CoastEd program for the past 15 years.

The Griffith Centre for Coastal Management has a team of award winning coastal engineers working on the latest technology, management techniques and research projects. Integrating their knowledge base throughout the CoastEd programs has ensured credibility, sound information and accuracy.

Enjoy the use of this pack for your classes and get in touch with our CoastEd team for questions or further information about the coastal engineering of the Gold Coast!

Maggie Muurmans
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COASTED PROGRAMS FOR SCHOOLS

COAST**ED** PROGRAMS FOR SCHOOLS

CoastEd is a community and school based coastal education program that provides the opportunity for Gold Coast community groups, schools and kindergartens to learn about the coastal zone. Primary and Secondary school sessions are matched to the Australian Curriculum and accompanied with optional curriculum based worksheets tailored to the level of the participants.

In partnership with the City of Gold Coast, the program offers a limited number of free and subsidised education sessions covering a wide range of topics that relate to the Gold Coast coastal zone. Our interactive sessions and hands-on activities can be booked for 30 or 60 minutes. There are also options to extend your session or add additional programs for a small cost. All sessions are facilitated by experts in the field of coastal management, coastal engineering, marine science and environmental education.

Sessions can be undertaken at your school, a community hall, on a local beach or at Griffith University Gold Coast Campus. Sessions can include surveys, flora and fauna identification techniques and primary data collection.

The CoastEd programs will be a suitable extension on your lessons in this teacher pack or field study excursion. Please note that new sessions are regularly added. The sessions with a focus on Coastal Engineering and Management are:

KINDERGARTEN PROGRAMS:

BeachCare Activity (Incursion)

Our CoastEd facilitator will visit your centre to teach pre-school aged children about the importance of beach vegetation. After an interactive presentation children will be involved in a planting activity using native coastal vegetation. It is optional for the children to attend a BeachCare event near their location to plant their plants in the dunes.

PRIMARY SCHOOL PROGRAMS:

Weather and How it Affects Our Coast (Excursion)

An exciting excursion where students learn about how weather affect our coastline. The CoastEd representative will talk about storms and cyclones in the Gold Coast history. The session will focus on how we protect our coastlines from weather impacts. Students are able to take temperature measurements of the sand, the air and the water. Through the wind speed meters students are able to record how strong the wind is and its direction. Using the cloud chart, students will be able to identify cloud formations. Simple data-sheets will be provided for students to record their findings and report on the management in place by GCCC to protect our shorelines from weather impacts.

Keywords: Weather, Climate Change, Cloud identification, coastline protection, data recording

What's that plant? & Beach Care (Excursion)

Students will learn about dunes and their importance for our coast. This activity will follow into learning about the plants through a treasure hunt in the dunes using the Coastal Plant pocket

guide. E.g students need to find a spiky plant, describe it (its leaves are..., it's xxx cm tall), identify it and draw it. The session will conclude by planting dune plants and as a result students are assisting in actively re-vegetation the dunes.

Keywords: Ecosystems, Dunes, Plant identification, Coastal management and sketching

Sand Stories (Incursion)

This incursion or excursion will concentrate entirely on sand. Students will learn about the origin of sand, how it ended up on the beach and what sand actually is. Students will split into groups and receive their own sand sample. They are able to look at sand through microscopes and complete a sand studies sheet. This sheet includes questions such as: list or use crayons to show all of the different colours that you see, draw a picture of some of your sand grains, which of the following things can you find in your sand (small rocks, pieces of plants, pieces of shells etc.). The students will be introduced to different sand from different areas in the world and within Australia and learn about why there are such differences in sizes of sand grains, colours and shapes. The session will conclude with students presenting about their sand sample and find out where their sand sample has their origin.

Keywords: Geology, Use of Microscopes, Identification techniques and Coastal processes

Plastic Ocean (Incursion)

This session will focus on the issue of marine debris. A presentation will be delivered by a CoastEd representative on Marine litter, its effects on marine wildlife, how it made its way to the coast and the pacific garbage patch. Students will learn about the types of litter on the coast and what the Gold Coast City council has in place to mitigate this issue. The session will conclude where the class is split up in groups of 4, with each group looking at a sample of rubbish (that has been brought along by the CoastEd representative). Each group will list at least 5 items they are able to identify and note how this item might have ended up on the beach. Each group will also list solutions next to each identified item on how they can prevent that this item will not be found on the beach anymore.

Keywords: Marine debris, Environmental threats and Conservation techniques

Managing Our Coastline & Coastal Processes (Incursion & Excursion)

Through an interactive presentation at your school or local beach, students are introduced to the natural processes that shape our coast. Longshore drift is visually explained and the CoastEd representative will highlight the history of the Gold Coast beaches and what coastal management techniques are in place to mitigate natural processes such as erosion. Depending on the choice of your excursion location, certain coastal management techniques will be highlighted including sand bypass systems, beach nourishment, dredging etc.

Keywords: Coastal processes, shoreline management, beach ecology and coastal environments, history of Gold Coast beaches

SECONDARY SCHOOL PROGRAMS:

Beach Care (Excursion)

Caring for our dunes and natural dune vegetation is the focus of this session. The CoastEd

representative will briefly introduce the importance of natural dunes with regards to coastal protection, the history of dunes on the Gold Coast and the current work being done to restore them. The session will conclude with planting native dune vegetation to assist the regeneration of the area. It will allow active involvement in re-vegetation of local dunes and harbour environmental stewardship. This session may incur a cost to buy the plants. The session will take place at one of the 10 BeachCare sites, with a preference to hold the session on a Thursday or Friday.

Keywords: Dunes, Coastal Processes, Re-vegetation, Native plants, Planting

Studies in Sand (Incursion)

This incursion or excursion will concentrate entirely on sand. Students will learn about the origin of sand, how it ended up on the beach and what sand actually is. Students will split into groups and receive their own sand sample. They are able to look at sand through microscopes and complete a sand studies sheet. This sheet includes questions such as: list or use colours to show all of the different colours that you see, draw a picture of some of your sand grains, which of the following things can you find in your sand (small rocks, pieces of plants, pieces of shells etc.). The students will be introduced to different sand from different areas in the world and within Australia and learn about why there are such differences in sizes of sand grains, colours and shapes. The session will conclude with students presenting about their sand sample and find out where their sand sample has their origin.

Keywords: Geology, Use of Microscopes, Identification techniques and Coastal processes

How to Measure the Health of a Beach (Excursion)

Griffith Centre for Coastal Management has recently conducted a study to measure indicators which allow to quantify the health of a particular beach. Students will receive an introduction to beach health and a brief presentation on coastal processes/coastal management before they will undertake their individual assessment on a selection of beaches. Factors such as economic, natural and recreational health will all be taken into account and will promote discussion between the students and their assessments.

Keywords: Beach health, indicators, survey, coastal management

Climate Change and How it Affects the Gold Coast (Excursion)

This session will focus on the effect of climate change on our coastline. Information will be presented about how climate change has been a constant variable throughout the earth's history. The students will also be taught about how humans have influenced climate change and how it is impacting different environments and communities around the world.

For the Excursion, students will undertake their own primary data collection through beach profiling to determine how 1 meter of sea level rise would effect the beach and foreshore. Furthermore the students will investigate how king tides and spring tides would affect the coastline in combination with sea level rise. From the data and information provided the students will be able to make conclusions about how the Gold Coast beaches are at risk of certain aspects of climate change.

Students will also develop a better understanding of how the Gold Coast City Council conducts management programs such as sand pumping and beach nourishment as well as dune re-vegetation to help prevent erosion issues and protection of infrastructure.

Keywords: Climate change, primary data collection, beach profiling, coastal management

Cyclones & Storm Tide Risk Assessment in Emergency Management (Excursion)

Through an interactive presentation at Griffith University, students will be introduced to a computer model which allows for real-time storm risk assessment in emergency management for the Queensland coastline.

Storm tide presents the greatest risk to life in tropical cyclone events. This session will focus on cyclones (hurricanes, typhoons), how they are formed, the destructiveness of their categories and the various effects of the angle of the cyclone hitting the coastline. The students will use the computer model to visualise the differences of intensity of the various categories of cyclones and learn how to identify the most advantageous areas to evacuate in the case of a severe cyclone. They will learn about coastal planning with regards to cyclones and storm tides.

Keywords: Coastal Hazard Management, Weather, Cyclones, Storm Tides, Wind speed

Spotlight on Palm Beach (Excursion)

Through an interactive presentation at Palm Beach, students are introduced to the natural processes that shape our coast. Longshore drift is visually explained and the CoastEd representative will highlight the history of the Gold Coast beaches and what coastal management techniques are in place to mitigate natural processes such as erosion. This session will focus on Palm Beach, the erosion issues at this location and certain coastal management techniques that are planned or currently active such as beach nourishment.

Keywords: Coastal processes, shoreline management, beach ecology and coastal environments, history of Gold Coast beaches, Burleigh

Spotlight on Burleigh Beach (Excursion)

Through an interactive presentation at Burleigh Beach, students are introduced to the natural processes that shape our coast. Longshore drift is visually explained and the CoastEd representative will highlight the history of the Gold Coast beaches and what coastal management techniques are in place to mitigate natural processes such as erosion. This session will focus on Burleigh and certain coastal management techniques at this location such as beach nourishment and dredging.

Keywords: Coastal processes, shoreline management, beach ecology and coastal environments, history of Gold Coast beaches, Burleigh

Spotlight on Kirra (Excursion)

Through an interactive presentation at Kirra, students are introduced to the natural processes that shape our coast. Longshore drift is visually explained and the CoastEd representative will highlight the history of the Gold Coast beaches and what coastal management techniques are in place to mitigate natural processes such as erosion. This session will focus on Kirra and certain coastal management techniques at this location (such as groynes) as well as how issues with the surfing communities with regards to these techniques have been mitigated.

Keywords: Coastal processes, shoreline management, beach ecology and coastal environments, history of Gold Coast beaches, Kirra

Spotlight on The Spit (with Optional Visit to Sand Bypass System Control Room) (Excursion)

Through an interactive presentation at the Spit, students are introduced to the natural processes that shape our coast. Longshore drift is visually explained and the CoastEd representative will highlight the history of the Gold Coast beaches and what coastal management techniques are in place to mitigate natural processes such as erosion.

This session will focus on the Spit and the Broadwater and certain coastal management techniques at this location (such as sand pumping) as well as community consultation in local issues.

There is the option to also visit the control room of the sand bypassing system to provide the students with a visual understanding of the workings of the system. This will include a walk on the Jetty.

Keywords: Coastal processes, shoreline management, beach ecology and coastal environments, history of Gold Coast beaches, Seaway.

For further information on these sessions or bookings please refer to www.griffith.edu.au/coasted or email CoastEd Coordinator Maggie Muurmans or telephone on (07) 555 28823.

PRIMARY EDUCATION:

LESSON PLANS: FOUNDATION TO SIX

YEAR ONE

THE BEACH, SURF, SEA AND SEA CREATURES

Aim:
Students will be able to identify elements of the beach, surf, sea and sea creatures

Prior Knowledge:
Students should draw on prior experiences of the beach, surf, sea and sea creatures.

Focus Questions:
What do I know about the beach, surf, sea and sea creatures?

What would I like to know?

Useful Vocabulary:
Beach, sand, surf, swim, wave.

ACTIVITY:

Introduction:
Here is a beautiful photograph (provided on next page). Can anyone tell me what this is a photograph of? What different things do you see? (Teacher writes responses on a large chart to develop a Vocabulary Bank.) What else might you see or experience on the beach?

Draw around the outside of your hand. On each finger, write the name of something you can see, hear, touch, smell and taste at the beach. In the palm write one word to describe how you feel at the beach. Follow with class discussion and teacher adds to Vocabulary bank.

Drama Activity:
Teacher divides students into groups and allocates roles:

- Small Wave
- Big Wave
- Surfers
- Swimmers
- Fish

Scenario:
Imagine you are all part of the sea. The surfers and swimmers are enjoying the water where the fish are swimming, then along comes a small wave, which breaks and falls into the water, and gets flatter and flatter. All the swimmers remain standing, and the surfers stay on their surfboards.

Then, along comes a big wave that rushes past the swimmers and surfers, then curls over and gets flatter and flatter. The swimmers and the surfers then fall to the ground. Then the swimmers and surfers walk out of the sea back to the beach. The fish remain swimming in the sea.

Students practise their drama, then present it to their class. Class feedback for each presentation; what worked well?

Extension task:
Draw a picture of the beach. This will demonstrate achievement of the aim to be able to identify elements of the beach, surf, sea and sea creatures. More able students can label their drawing, using key words.

Feedback & Evaluation:
Can you think of one thing you have learnt today about the beach, surf, sea and sea creatures?

What else would you like to know about the beach, surf, sea and sea creatures? Teacher could record responses and/or use to inform future learning

Link(s) to Australian Curriculum:

- HASS: Knowledge and Understanding: Geography:

  The natural, managed and constructed features of places, their location, how they change and how they can be cared for (ACHASSK031)

- HASS: Inquiry and Skills: Evaluating and Reflecting:

  Draw simple conclusions based on discussions, observations and information displayed in pictures and texts and on maps (ACHASSI025)

- HASS: Inquiry and Skills: Communicating:

  Present narratives, information and findings in oral, graphic and written forms using simple terms to denote the passing of time and to describe direction and location (ACHASSI027)

- DRAMA: Explore role and dramatic action in dramatic play, improvisation and process drama (ACADRM027)

- DRAMA: Use voice, facial expression, movement and space to imagine and establish role and situation (ACADRM028)

(Source: http://www.goldcoast.qld.gov.au)

YEAR ONE

THE CHARACTERISTICS OF A BEACH

Aim:
Develop students' awareness and understanding of the characteristics of a beach through comparison with their home environment.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
What are the characteristics of a beach?

How does this compare to the outside space you have at home?

Useful Vocabulary:
Dunes, sand, house, water, plants, life guards, crabs, birds, house, garden, river, lake, sun, surfer, wave, jetty, diving, hat, sunscreen, location, beach, tides, erosion.

ACTIVITY:

Main Activity:
Ask students to close their eyes and imagine that they are at home, but outside. This might be in the garden, or in the street outside where they live.

Ask each student to name something they can see. Is everyone's outside space the same? What differences are there?

Extension task:

Use all of the senses; what can you smell, hear, touch or taste?

Now look at the photograph of a beach (see below)

What can you see in the picture?

Compare the beach to your outside space at home, either with think, pair, share or whole class discussion. Try to think of at least 3 differences (e.g. sand on the beach, soil in the garden).

Extension task:
Look at photos from a range of beach habitats such as the water, mangroves, rocky shores, sand, dunes, park area and use to make links and comparisons.

Follow up activity:
Ask students to bring in a photograph of their outside space. Use the photos to create a class map. You could use a map of the local area and put photos where each student lives, or put the beach photo in the middle and students can place their photos according to how near or far they think they live from the beach.

Link(s) to the Australian Curriculum:

- HASS: Knowledge and Understanding: Geography

  Using observations of the local place to identify and describe natural features (for example, hills, rivers, native vegetation), managed features (for example, farms, parks, gardens, plantation forests) and constructed features (for example, roads, buildings) and locating them on a map (ACHASSK031)

- SCIENCE: Science Inquiry Skills: Evaluating

  Discussing observations as a whole class to identify similarities and differences in their observations (ACSIS213)

- ENGLISH: Literacy: Interacting with others:

  Engage in conversations and discussions, using active listening behaviours, showing interest, and contributing ideas, information and questions (ACELY1656)

Teacher resources:

- Griffith Information Sheets:

  https://www.griffith.edu.au/__data/assets/pdf_file/0005/322871/Dunes-of-the-Gold-Coast.pdf\

  https://www.griffith.edu.au/__data/assets/pdf_file/0009/322839/Sandy-beach-ecology.pdf

YEAR TWO

THE COASTLINE: WIND, WATER AND WAVES

Aim:
To develop understanding of and explore the links between Wind, Water and Waves.

Prior Knowledge:
Students should draw on prior experiences of the coastline, wind, water and waves.
Students should be able to identify the coastline, wind, water and waves.

Focus Questions:
What actions can I see happen at the beach?
What do Wind, Water and Waves do?

Useful Vocabulary:
Wind, water, wave, noun, verb.

ACTIVITY:

Introduction:
Teacher shows students a picture of the beach. Discuss what they can see and encourage students to share their own experience of the beach.

Ask students how many words they can think of beginning with 'W' which can be found at the beach. (Wind, Water, Waves) Can they think of any links between these three nouns?

Main Activity:
Discuss the difference between waves and water. Demonstrate how waves are created. Teacher could use a bowl of water and blow on it to show how wind + water = waves. Use a fan if available for more dramatic waves!

Extension task:
Pupils to think of verbs to describe what the wind, water and waves are doing on the beach.
Write 3 sentences using the nouns Wind, Water and Waves, explaining the link between them.
The wind _____ (blows, gusts)
The water_____ (moves, ripples)
The waves_____(crash, splash)

Feedback & Evaluation:


I know how wind, water and waves are linked.


I think I know how wind, water and waves are linked.


I'm not sure how wind, water and waves are linked.

Link(s) to Australian Curriculum:

- HASS: Inquiry and skills: Evaluating and reflecting:

  Draw simple conclusions based on discussions, observations and information displayed in pictures and texts and on maps (ACHASSI008, ACHASSI025, ACHASSI041)

- HASS: Inquiry and Skills: Communicating:

  Present narratives, information and findings in oral, graphic and written forms using simple terms to denote the passing of time and to describe direction and location (ACHASSI010, ACHASSI027, ACHASSI043)

- SCIENCE: Science Understanding:

  Physical sciences A push or a pull affects how an object moves or changes shape (ACSSU033)

- ENGLISH: Language: Expressing and developing ideas:

  Understand that nouns represent people, places, concrete objects and abstract concepts (ACELA1468)

Teacher resources:
What actions can I see happen at the beach?
(Source: http://www.goldcoast.qld.gov.au/library)

YEAR TWO

BEACH EROSION

Aim:
Begin to understand how erosion occurs and develop awareness of Coastal Management techniques.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
What is erosion?

How does it affect people living on the Gold Coast?

How can we manage erosion events?

Useful Vocabulary:
Sand, waves, house, beach.

ACTIVITY:

Main Activity:
Explain the process of erosion – Waves and wind move the sand on a beach.

Divide the class into 4 groups and allocate roles – house, sand, waves, wind.

- Houses – you stand tall, in a line. You begin to fall over if waves and wind get too close to you.
- Sand – you are small and round, on the floor in front of the houses. You move when waves or wind come near you.
- Waves – you are tall and move towards and away from the sand.
- Wind – you move in any direction.

Arrange the groups in their positions and explain that movement is going to be in slow motion so the effects can be carefully observed.

Instruct the wind to start 'blowing', then the waves start moving. The sand moves in response to the wind and waves. Once the sand has moved, the houses begin to fall down.

Ask all students to stop and think – how could we prevent the wind and waves from moving the sand and damaging the houses? For example, you could build a wall or add more sand. Reallocate roles (e.g. take some students from each group to be the wall or more sand) and enact different scenarios to explore the effect.

Link(s) to Australian Curriculum:

- HASS: Inquiry and skills: Analysing:

  Comparing places that differ over time or across location (for example, climate, natural environment, plants, animals, people's home) (ACHASSI039)

Teacher resources:

- Griffith Information Sheet:

  https://www.griffith.edu.au/__data/assets/pdf_file/0010/333685/Beach-erosion.pdf
- City of Gold Coast:

  http://www.goldcoast.qld.gov.au/three-point-plan-for-coastal-protection-17451.html
- Brisbane Times:

  http://www.brisbanetimes.com.au/queensland/gold-coast-beach-erosion-plan-is-the-plan-on-the-right-track-20150705-gi5cz2.html
- Department of Environment and Heritage Protection:

  https://www.ehp.qld.gov.au/coastal/pdf/gc-beach-erosion-factsheet.pdf

YEAR THREE

KEEPING OUR COASTLINE CLEAN AND HEALTHY

Aim:
Create a persuasive text to demonstrate understanding of the importance of keeping our coastline clean and healthy.

Prior Knowledge:
Student experiences of the beach and coastline.

Student knowledge and understanding of the beach, the coastline, marine and land animals and birds.

Students should be able to identify some of the types of litter that pollute our coastline, how they got there, and ways to prevent littering our beautiful Australian coastline.

Focus Questions:
What is a coastline?

How can we keep it clean and healthy?

Why is it important to keep the coastline clean and healthy?

Useful Vocabulary:
Coastline, environment, "Clean Up Australia Day" (CUAD), pollution, ecology (the interrelationships of all living things), pollution, litter.

ACTIVITY:

Introduction:
What is a coastline? Discuss & create a class definition.

Teacher divides the class into 8 groups, each group gets a question:
What does a healthy coastline look like?
What does an unhealthy coastline look like?
Who/what will be affected by an unhealthy coastline?
What is litter? Where does it come from?
Why is it wrong to drop litter?
How might litter affect the animals on a coastline?
How might litter affect the people on a coastline?
What can we do about litter?

Give discussion time, then feedback to the class.

Main Activity:
Create a poster for Clean Up Australia Day. How will you encourage others to clean up our coastline? What words and images could you use to show that it is important?

Option for students to use the internet to find images or draw their own.

Extension task:
Present posters to class, explaining your choices of words and images.

Feedback & Evaluation:
Who has the most persuasive poster? Why?

Link(s) to Australian Curriculum:

- HASS: Inquiry and skills: Evaluating and reflecting:
  Interact with others with respect to share points of view (ACHASSI059, ACHASSI080)
- HASS: Knowledge and Understanding: Civics and citizenship:
  Why people participate within communities and how students can actively participate and contribute (ACHASSK072)
- ENGLISH: Language: Text structure and organisation:
  Understand how different types of texts vary in use of language choices, depending on their purpose and context (for example, tense and types of sentences) (ACELA1478)
- ENGLISH: Literacy: Interacting with others:
  Listen to and contribute to conversations and discussions to share information and ideas and negotiate in collaborative situations (ACELY1676)
- LITERACY: Interpreting, analysing, evaluating:
  Identify the audience and purpose of imaginative, informative and persuasive texts (ACELY1678)
- ENGLISH: Literacy: Creating texts:
  Plan, draft and publish imaginative, informative and persuasive texts demonstrating increasing control over text structures and language features and selecting print,and multimodal elements appropriate to the audience and purpose(ACELY1682)

Teacher resource:

- Litter definition, effects, resources:
  http://www.coolaustralia.org/worksheet-view/teacher_worksheet/12751/?access_key
- Healthy vs. unhealthy ocean:
  http://www.coolaustralia.org/activity/earth-hour-healthy-versus-unhealthy-oceans-year-3-4/


THE UGLY JOURNEY OF OUR TRASH
Marine debris is the rubbish of our everyday lives that makes its way into our ocean. Rubbish travels over land, down streams, rivers and storm drains to the ocean. Once in the ocean, it can drift thousands of miles from its origin to the most remote ocean places, leaving a wake of destruction in its path. Every year, debris kills thousands of marine animals and sea birds, chokes coral reefs and smothers critical environments. It also contaminates our beaches and favorite recreation sites. Better information about sources and impacts is extremely important to drive changes in infrastructure and waste management policies at all levels. Who is responsible? All of us. Together we can help prevent and clear up this mess for a clean, healthy ocean planet.
Annual plastic production and use of plastics has risen from 1.5 million tons in 1950 to 230 MILLION TONS in 2009
OVER 6 MILLION TONS of marine litter may be entering our ocean every year
As much as 90 PERCENT of floating marine debris may be plastic
Research of the northern fulmar (a seabird) showed 95 PERCENT of dead, beached birds collected had plastic in their stomachs
Between 50,000 AND 90,000 northern fur seals are estimated to be dying every year entangled in marine debris
More than 260 SPECIES are reported to have been entangled in, or to have ingested, marine debris
35 PERCENT of plankton-eating fish found during a study in the North Pacific Central Gyre had ingested plastic
As much as 70 PERCENT of marine litter has been estimated to end up on the seabed
PROJECT AWARE
Scuba divers are standing up to the onslaught of debris – fins on and off. We're removing debris underwater and logging the data to influence change at all levels. On land, we can work together to stop rubbish from entering the ocean. We can help inform community action and identify local solutions.
Join the movement at www.projectaware.org

YEAR THREE

SAVE OUR SAND

Aim:
Develop an awareness and understanding of the importance of sand.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
Who likes to go to the beach?

What is so special about the Gold Coast Sand?

Why is sand such an important factor to the coastal processes?

What kind of animals live within the sand?

How do we take care of the vulnerable resource sand?

Useful Vocabulary:
Sand, dunes, seawall, beach nourishment.

ACTIVITY:

Main Activity:
Ask students:

Who likes to go to the beach? Can you name your favourite beach?

Close your eyes and imagine you are standing on the beach. What can you see, hear, touch, taste, smell?

Now imagine the beach without sand. Would it still be your favourite beach?

Can you think of any animals that live in the sand at the beach? As well as creatures you can see like crabs, millions of tiny critters live in the sand! What would happen to these creatures if there was no sand? They'd have nowhere to live.

Use the Sandy Beach Ecology information sheet to learn more about the creatures that live in sand. Explain the difference between macrofauna (creatures you can see) and meiofauna (creatures too small to see).

Why would sand move away from our beaches? It's moved by wind and waves.

What can we do to protect the sand? Sea walls protect the sand from wind and waves and stop it from moving around. We can add sand to the beach so it's not so vulnerable to erosion.

Extension task:
Use the information sheets below to learn more about how to protect sand.

Create a poster to raise awareness of why the sand on our beaches is so important. You could emphasise its value to us and to the creatures that live in a sandy beach habitat.

Link(s) to the Australian Curriculum:

- HASS: Evaluating and reflecting:

  Draw simple conclusions based on analysis of information and data (ACHASSI058, ACHASSI079)
  Interact with others with respect to share points of view (ACHASSI059, ACHASSI080)

- Science: Science Inquiry: Questioning and predicting

  With guidance, identify questions in familiar contexts that can be investigated scientifically and make predictions based on prior knowledge (ACSIS053)

- English: Literacy: Listening and speaking interactions:

  Listen to and contribute to conversations and discussions to share information and ideas and negotiate in collaborative situations (ACELY1676)

Teacher resources:

- Griffith Information Sheets:

  https://www.griffith.edu.au/__data/assets/pdf_file/0019/530029/Caring-for-our-coast_sand-excavation.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0009/322839/Sandy-beach-ecology.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0017/322730/Gold-Coast-beach-nourishment.pdf

YEAR FOUR

THE HISTORY OF OUR BEAUTIFUL GOLD COAST BEACHES

Aim:

Develop understanding of how all beaches, including those on the Gold Coast, change over time. Encourage stewardship of our planet earth and demonstrate that humans can and should keep our beaches beautiful and clean for the next generation of humans and of marine animals.

Prior Knowledge:

Students should draw on their prior experiences of beaches. Students should be able to identify beach characteristics and name local Gold Coast beaches.

Focus Question:

How have our beautiful Gold Coast beaches changed over time?

Useful Vocabulary:

Coastline, erosion, pollution, ecology (the interrelationships of all living things), evolution.

ACTIVITY:

Introduction:

Warm up question: How many Gold Coast beaches can you name?

Show selection of images (see below). Can students guess where and when each image was taken? Discuss how beaches have changed. Why do beaches change?

Extension Task:

Watch the History of Gold Coast Beaches (17.5min):

Main Activity:

Divide the class into pairs and give each pair a beach to research. Students should focus on finding out how their beach has changed in the last 100 years. Research could focus on areas such as how the beach habitat has changed and development around the beach, e.g. houses, roads, shops etc. They may use a mixture of words and images to show their findings in a brief powerpoint presentation.

- Bilinga
- Broadbeach
- Burleigh Heads
- Coolangatta
- Currumbin
- Greenmount
- Kirra
- Main Beach

- Mermaid Beach
- Miami
- Narrowneck
- Nobby Beach
- North Burleigh
- North Kirra
- Palm Beach
- Rainbow Bay
- Tallebudgera
- Tugun
- South Stradbroke Island
- Surfers Paradise

Extension task
Consider how your beach will change in the next 100 years. What factors might affect this?

Feedback & Evaluation:
Each pair shares their findings with the class.

Link(s) to the Australian Curriculum:

- HASS: Knowledge and Understanding: Geography:
  The importance of environments, including natural vegetation, to animals and people (ACHASSK088)
- HASS: Knowledge and Understanding: Geography:
  The use and management of natural resources and waste, and the different views on how to do this sustainably (ACHASSK090)
- HASS: Inquiry and Skills: Researching:
  Locate and collect information and data from different sources, including observations (ACHASSI053, ACHASSI074)
- HASS: Inquiry and Skills: Analysing:
  Interpret data and information displayed in different formats, to identify and describe distributions and simple patterns (ACHASSI078)
- HASS: Inquiry and Skills: Evaluating and reflecting:
  Draw simple conclusions based on analysis of information and data (ACHASSI079) Interact with others with respect to share points of view (ACHASSI080)
- HASS: Inquiry and Skills: Communicating:
  Present ideas, findings and conclusions in texts and modes that incorporate digital and non-digital representations and disciplinespecific terms (ACHASSI061, ACHASSI082)
- ENGLISH: Literacy: Interpreting, analysing, evaluating:

Read different types of texts by combining contextual , semantic, grammatical and phonic knowledge using text processing strategies for example monitoring meaning, cross checking and reviewing (ACELY1691)

- ENGLISH: Literacy: Interpreting, analysing, evaluating:

  Use comprehension strategies to build literal and inferred meaning to expand content knowledge, integrating and linking ideas and analysing and evaluating texts (ACELY1692)

  Use of software Use a range of software including word processing programs to construct, edit and publish written text, and select, edit and place visual, print and audio elements (ACELY1697)
- SCIENCE: Science Understanding: Earth and space sciences:

  Earth's surface changes over time as a result of natural processes and human activity (ACSSU075)

Teacher resource:

- Images of the Gold Coast:

  http://www.goldcoast.qld.gov.au/a-day-at-the-beach-9670.html
- History of Gold Coast beaches:

  https://www.youtube.com/watch?v=DaR9vMCTl4k&list=PLs53dPt8u9lal_YDRljZlmCGLdgMAA0R6&index=5

YEAR FOUR

HOW TO BUILD A REEF

Aim:
Develop an understanding on how a natural reef can be used as a template to create an artificial reef, which will have the same purpose as a natural reef.

Prior Knowledge:
No prior knowledge required.

Focus Question:
Why has the City of Gold Coast decided to build an artificial reef in Narrownneck and is planning to build one at Palm Beach?

Useful Vocabulary:
Coastline, sand movement, natural and artificial reef, construction

ACTIVITY:

Introduction:
Warm up question: What words come up in your mind when you hear the word 'reef' ?

Write all the different words students come up with on the blackboard.

Show students the pictures of reefs (see below).

Ask students: What are the different purposes of a reef ?

(Purpose: Habitat and nursery ground for many marine organisms, food and nutrient source)

Show the students pictures of the Narrowneck artificial reef and ask the students if the reef might also have a purpose to protect our coastline?

(Reefs protect coastlines from damaging effects of waves)

To help the students with their answers ask the students: Imagine yourself at the beach after a big storm has hit the coast where there is no reef in place. What do you expect to see? (Chaos, marine litter, sea weed on the beach etc.) What usually gets washed away from the beach by large waves? (sand)

Main Activity:
Divide the class into pairs. Tell the students that they must think like engineers and find a solution on how to retain sand on Palm Beach. Show the students the photo of Palm Beach after a series of storm events in 1967/2009 and ask them why they think you have chosen it. (Very narrow beach, (barely any sand left, massive erosion, no protective zone, A-wall exposed)

Each pair should think about a solution to keep sand on a beach. Ask the pairs to draw their ideas on a piece of paper. Allow the students 10 minutes time. When they are finished display all the different drawings. Ask each pair to briefly present their idea to the class.

Idea: Let the students think of a name for their team.

Some students might have thought of a solution involving a reef. Show all studentsthe aerial photoof Palm beach and also the aerial photo of Narrowneck artificial reef (see below). Ask the students what they see. Also ask them to compare the sand volume on the beach.

Tell the student that the Narrowneck is an artificial reef. Ask the student if they can explain what artificial means.

Can the students think of materials that could be used to construct an artificial reef ? (See pictures of different artificial reefs)

Show students the illustration of how the reef was built using sand bags (see Griffith Information factsheet: Narrowneck Artificial reef construction on the second page)

Extension task:

Start a discussion with the students and ask them if they find it important that the City of Gold Coast is putting artificial reefs in place?

Stream the students into thinking about recreational benefits from building an artificial reef (divers, fishers, great surf for surfers, wider beaches).

Link(s) to the Australian Curriculum:

- HASS: Inquiry skills:

  Interact with others with respect to share points of view (ACHASSI080)
- HASS: Inquiry skills:

  Reflect on learning to propose actions in response to an issue or challenge and consider possible effects of proposed actions(ACHASSI081)
- HASS: Civics and citizenship:

  The role of local government and the decisions it makes on behalf of the community(ACHASSK091)
- SCIENCE: Science Understanding: Earth and space sciences:

  Earth's surface changes over time as a result of natural processes and human activity (ACSSU075)

Teacher resource:

- Griffith Information Sheet:

https://www.griffith.edu.au/__data/assets/pdf_file/0004/286825/Narrowneck.pdf

Reef pictures:

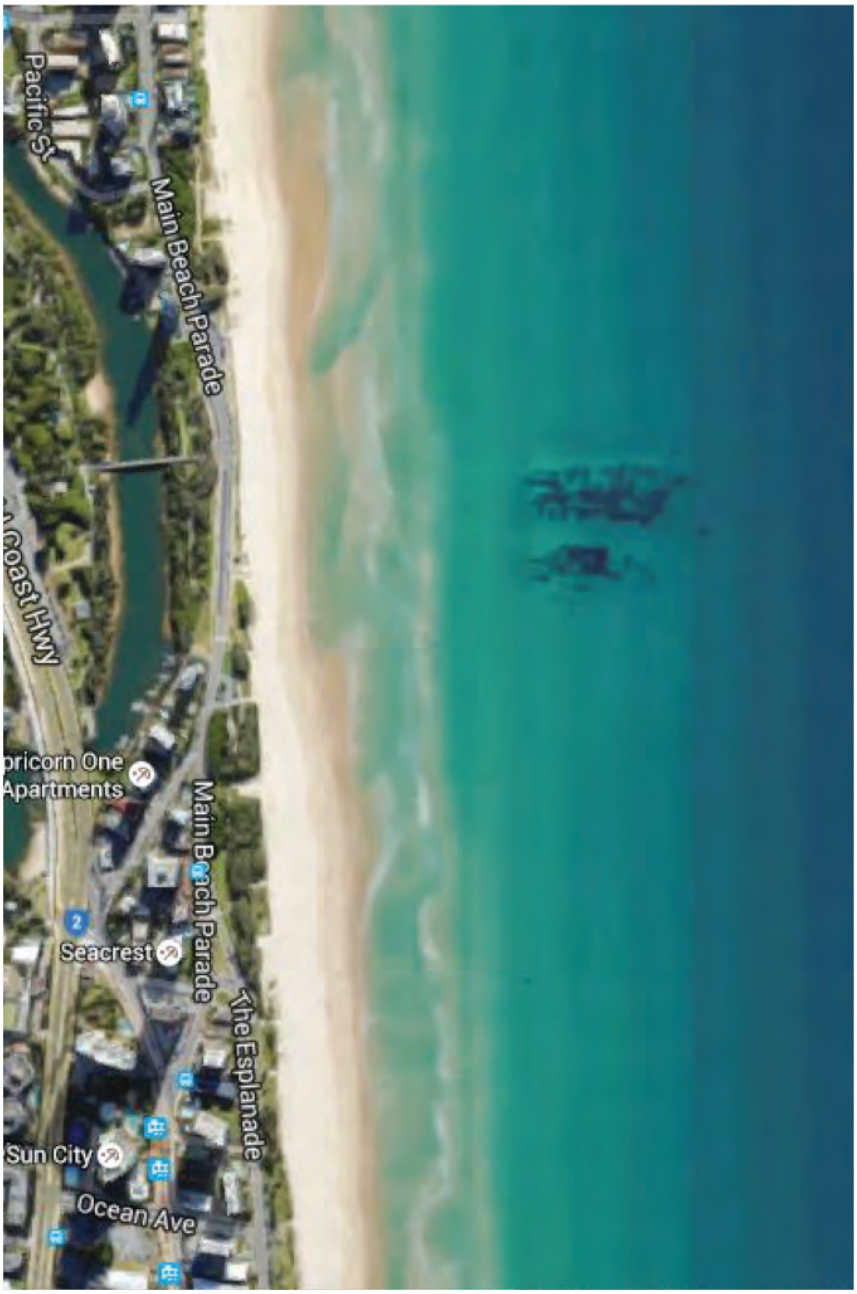
Narrowneck Reef:

Palm Beach after a series of storm events in 1967

Palm Beach after storm event in 2009

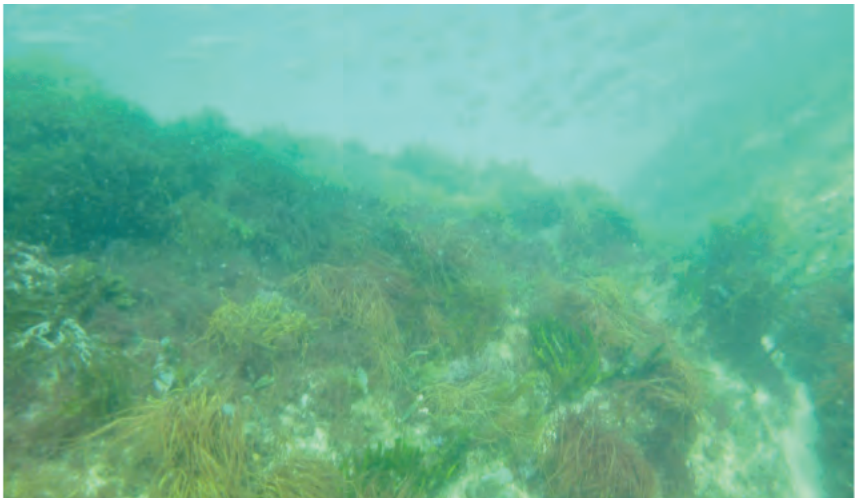
Aerial picture of Palm Beach:

Aerial picture of Narrowneck Beach:



Different materials for artificial reefs

Geotextile bags which were used for the Narrowneck reef



YEAR FIVE

LONGSHORE DRIFT

Aim:
Understand how our coastal environment changes over time and consider how human impact influences this.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
What is longshore drift?

Why are coastal management techniques in place?

What are the advantages and disadvantages of the management techniques?

Useful Vocabulary:
Longshore drift, movement, sand.

ACTIVITY:

Main Activity:
How does sand move? (Wind and waves)

What is longshore drift? Watch A river of sand, Longshore drift process on the Gold Coast (4mins) (link below)

Extension task:
Watch More than meets the eye, Gold Coast dynamic coastline (3.5mins) (link below)

Draw a picture/diagram that shows how longshore drift occurs. Students can create their own or refer to the image below.

Why is it important that we reduce the impact of longshore drift? What would happen if there was no sand on the beach? – think, pair, share.

How can we stop this from happening?

Sometimes more sand is added to the beach. Or a seawall is built to stop sand moving further up the coastline. Which of these do you think is most effective?

Link(s) to Australian Curriculum:

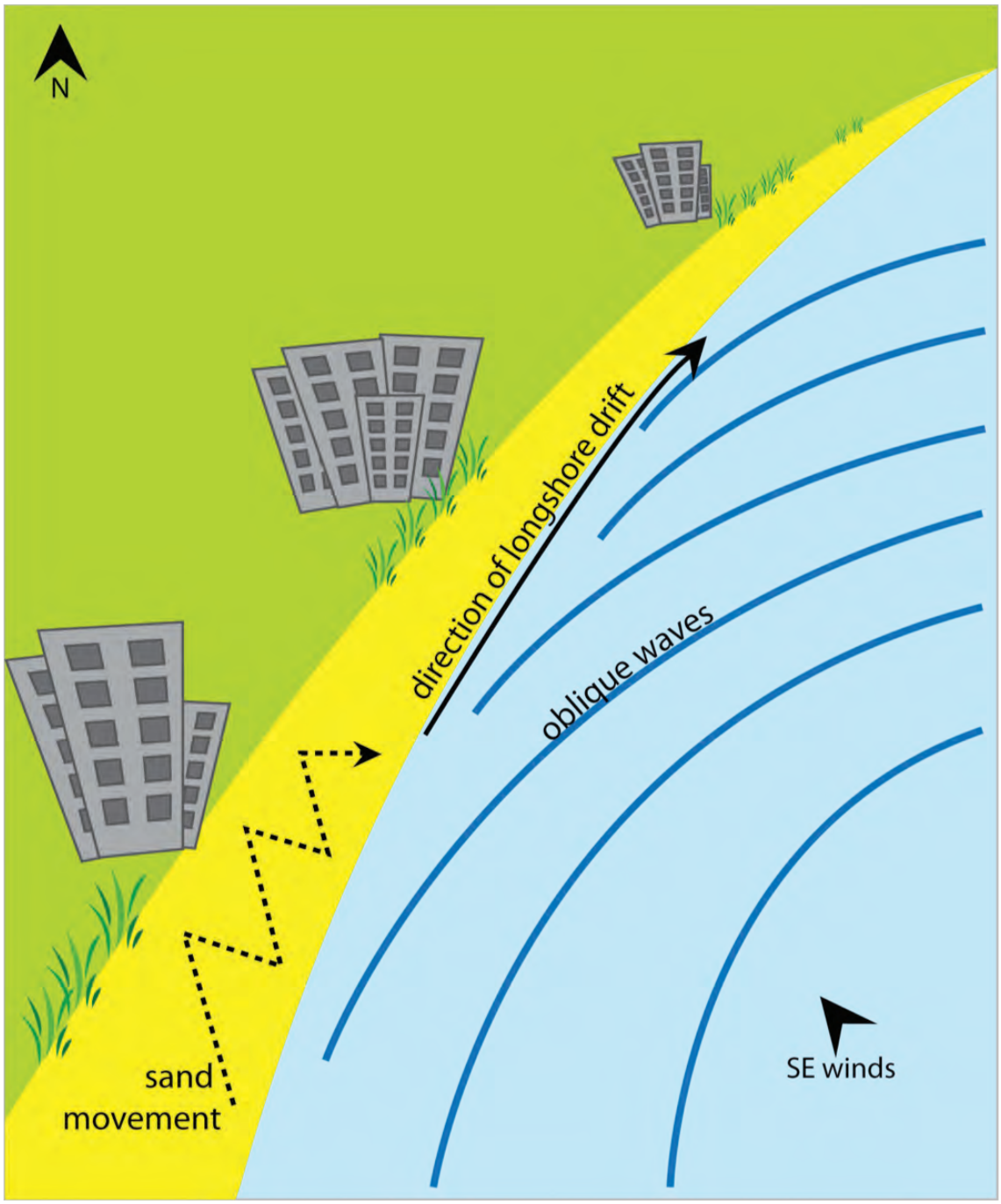
- HASS: Knowledge and Understanding: Geography:

  Exploring the extent of change in the local environment over time (for example, through vegetation clearance, fencing, urban development, drainage, irrigation, farming, forest plantations or mining), and evaluating the positive and negative effects of change on environmental sustainability (ACHASSK112)

Teacher resource:

- Griffith Information Sheets:
  https://www.griffith.edu.au/__data/assets/pdf_file/0009/322875/Longshore-drift.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0010/333685/Beach-erosion.pdf
- A river of sand, Longshore drift process on the Gold Coast (4mins): https://www.youtube.com/watch?v=XIfvVcVss7Y&list=PLs53dPt8u9lal_YDRljZlmCGLdgMAA0R6&index=18
- More than meets the eye, Gold Coast dynamic coastline (3.5mins):
  https://www.youtube.com/watch?v=X6Qr1KiYCdI&list=PLs53dPt8u9lal_YDRljZlmCGLdgMAA0R6&index=19



South easterly winds push the waves towards the beach and move sand along the coastline.

YEAR FIVE

EROSION AND THE EFFECT ON OUR COASTLINE OF WIND, STORMS AND CYCLONES

Aim:
Understanding the impact of the weather on the ecology of a beach, where humans and marine animals and birds inter-relate to one another and to their surroundings.

Prior Knowledge:
Students should draw on their prior experiences of beaches. Students should have an understanding of the ecology of the beach, the coastline and marine animals. Students should be able to identify beach characteristics and name local Gold Coast beaches.

Focus Question:
How does erosion affect the Gold Coast coastline through wind, storms and cyclones?

Useful Vocabulary:
Climate, Wind, Erosion, Storm, Cyclone, Flood

ACTIVITY:

Introduction:
Do you have a favourite beach? Close your eyes and imagine your favourite beach (or a beach you have visited). What can you see? Can you think of 5 things you can see at the beach? Discuss with the person next to you. Did they have the same things as you, or different?

Main Activity:
Is the beach the same every time you go there? What changes the beach?

Discuss erosion and the effect of wind, storms and cyclones.

Create a case study for Palm Beach. Watch the following video clips and read/listen to the information on each web page (see below). In your pairs, one person focusses on recording the problems or challenges. One person focusses on recording the solutions that are being discussed.

Create a poster / infographic using words and pictures to demonstrate your findings. You may refer to the information sheet attached (page 43).

Extension task:

Can you think of another beach that is affected in this way?

Feedback & Evaluation:

Do you think the solutions being suggested will work? Why?

What else would you like to know about this topic?

Link(s) to the Australian Curriculum:

- HASS: Knowledge and Understanding: Geography:

  The environmental and human influences on the location and characteristics of a place and the management of spaces within them (ACHASSK113)
- HASS: Knowledge and Understanding: Geography:

  The impact of bushfires or floods on environments and communities, and how people can respond (ACHASSK114)
- HASS: Inquiry and Skills: Researching:

  Locate and collect relevant information and data from primary and secondary sources (ACHASSI095, ACHASSI123)
- HASS: Inquiry and Skills: Communicating:

  Present ideas, findings, viewpoints and conclusions in a range of texts and modes that incorporate source materials, digital and non-digital representations and discipline-specific terms and conventions (ACHASSI105, ACHASSI133)

Teacher resource:

- City of Gold Coast:

  http://www.goldcoast.qld.gov.au/thegoldcoast/the-challenge-10961.html

  http://www.goldcoast.qld.gov.au/thegoldcoast/palm-beach-shoreline-project-10919.html

PALM BEACH - THE CHALLENGE

Palm Beach is very likely to suffer loss of property and damage to buildings as a result of storms. For example, in 2013 it was damaged by a storm called Cyclone Oswald.

Palm Beach is often damaged by erosion (movement of sand) and storm surges (when the sea level rises because of a storm). During a storm, sand is removed from the beach and taken out to sea.

Sand is also moved north along the beach by longshore drift. Sand does not always return to the beach naturally. So the way the beach looks can change. These changes may also affect nearby buildings and facilities.

In 2009 three storms damaged Palm Beach, where sections of the seawall were exposed and the viewing deck was lost at Palm Beach Avenue.

In June 1967, three severe storms hit the coastlines of southern Queensland and northern New South Wales, causing flooding and erosion of the city's beaches. Six people died.

Palm Beach's shoreline has been repeatedly eroded and various solutions have been put in place by the council to try to solve this problem.

PALM BEACH - THE SOLUTION

Palm Beach Shoreline Project

What will the Palm Beach Solution do?

Beach Replenishment

Sand will be taken from offshore and added to the beach. It will also be put near the shoreline to provide a "supply" of sand to the beach. This "works with nature" to evenly distribute the sand and widen the beach using natural processes.

19th Reef

The 19th Reef is a manmade reef which will bend and break the waves so that there is less energy in the wave when it hits the shore. The Reef will be designed to respond to the local swell and wind conditions, and will act as an extension to the existing natural reef.

Continuous Seawall

Seawalls can help prevent flooding. The City has completed seawalls along the most vulnerable parts of Palm Beach. The City is working with private property owners to encourage them to complete their seawalls.

Further information:

- City of Gold Coast:
  http://www.goldcoast.qld.gov.au/thegoldcoast/the-challenge-10961.html
  http://www.goldcoast.qld.gov.au/thegoldcoast/palm-beach-shoreline-project-10919.html

YEAR SIX

CLIMATE CHANGE AND THE EFFECTS ON THE GOLD COAST.

Aim:
Interpret and compare representations of how climate change will affect the sea level, making links and predictions.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
How will climate change affect the sea level?

What might happen to the Gold Coast in the future?

Useful Vocabulary:
Climate change, temperature, heatwave, rainfall, flooding, bushfires, greenhouse gas emission.

ACTIVITY:

Main Activity:
Watch the clip (2 mins) and read the news article on how rising sea levels will affect our coastline (link below).

Ask students to guess how much they think the sea level might rise by 2100. Explain that scientists believe it is going to rise by a minimum of half a metre, and up to 1.1 metre. A more detailed explanation is available from the ozcoasts website (link below).

Look at the flood map (link below). Zoom into your area and adjust the sea level rise in the top left hand corner to show how the coastline would be affected. Note that even a 1m rise means the beaches all disappear!

Use the information from these three sources to predict what the coastline might look like in 2100. Option to either draw a picture or write a description of what the Gold Coast would look like and how it would be affected.

Link(s) to Australian Curriculum:

- HASS: Inquiry and skills: Analysing:

  Interpreting graphic representations and making inferences about patterns and/or distributions (ACHASSI128)

Teacher's resources:

- News article:

  http://www.news.com.au/national/climate-council-report-predicts-rising-sea-levels-will-cause-200-billion-of-damage-to-coastal-infrastructure-by-2100/news-story/0b8edcaf0512a3ccea836274d8d5c8b8

- Ozcoasts:

  http://www.ozcoasts.gov.au/climate/sd_visual.jsp

- Flood map
  http://flood.firetree.net/?ll=-27.8390,138.1640&z=13&m=7
- Climate council:
  http://www.climatecouncil.org.au/uploads/ff37af7492b4b698420c1aebdaed54a0.pdf
- Bureau of Metrology:
  http://www.bom.gov.au/climate/current/annual/qld/summary.shtml
- Bureau of Metrology Rainfall and Temperature Data finder:
  http://www.bom.gov.au/climate/data/
  Tip: Cape Moreton Lighthouse has the best data availability for temperature)
- Picture on how the Gold Coast might look like in 2050: http://www.chinapost.com.tw/news_images/20100316/p10d.jpg

YEAR SIX

CLIMATE CHANGE AND THE EFFECTS ON THE GOLD COAST.

Aim:
Use drama and debating skills to consider the advantages and disadvantages of coastal development on the Gold Coast. This activity develops logical thinking skills as well as higher-order thinking skills as students explore and take on particular viewpoints to attempt to resolve a contentious, real-life issue.

Prior Knowledge:
Students' prior experiences and knowledge of building development, high-rise, traffic bottlenecks, traffic fumes, loss of beach access by the public, afternoon shadows on the beach, increased litter and pollution, media coverage of developments.

Focus Questions:
What are the impacts of coastal development on the Gold Coast?

Useful Vocabulary:
Development, Environment, Habitat

ACTIVITY:

Introduction:
Examine the image of a proposed Gold Coast development (see below). Explain to the class that a (fictional) company, Worldwide Hotels Inc., wants to build a new apartment building with luxury facilities on the Gold Coast.

Brief class discussion – Do you think this is a good idea? Why? Who will be affected?

Main Activity:
Divide the class into groups of 4 or 5 students. Give each student a role within the group.

Resident (in groups of 5 students, there can be 2 residents, 1 adult, 1 child.) You live and work in the area.

Tourist You visit the area for your holidays every year.

Developer Your company wants to build a new apartment building with luxury facilities on the Gold Coast.

Environmentalist You are concerned about protecting the local environment, including animals, plants and their habitats.

Individual thinking time. Students may write or record their ideas in any way they find helpful. Instructions for students:

1. Consider your character's situation.
2. What might the advantages of a new development be for your character?
3. What might the disadvantages of a new development be for your character?
4. Do you want the development to go ahead?
5. How will you persuade others to agree with you?

Group discussion. Staying 'in character', take it in turns to explain your opinion to the rest of the group. Once each person has spoken, the rest of the group may ask questions.

Extension task:
Decide if you think the new development is a good idea. Vote within your group.

Feedback & Evaluation:
As a group, present your most persuasive arguments either for or against the new development to the class. After each presentation, the class votes if they agree or disagree with the group.

Link(s) to the Australian Curriculum:

- HASS: Knowledge and Understanding: Economics and business:

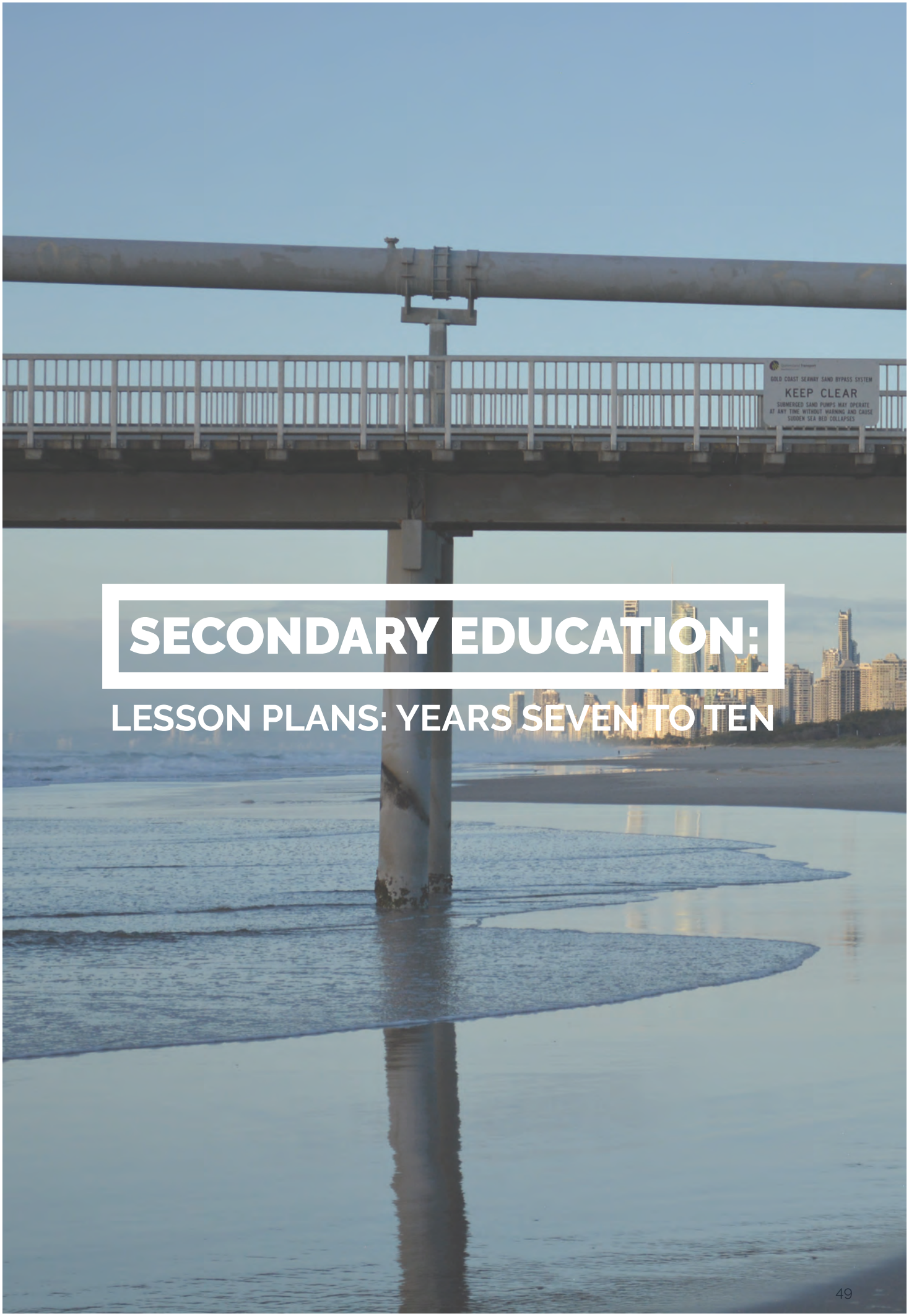
  How the concept of opportunity cost involves choices about the alternative use of resources and the need to consider trade-offs (ACHASSK149)

- HASS: Knowledge and Understanding: Economics and business:

  The effect that consumer and financial decisions can have on the individual, the broader community and the environment (ACHASSK150)

- HASS: Inquiry and Skills: Analysing Examine different viewpoints on actions, events, issues and phenomena in the past and present (ACHASSI127)
- HASS: Inquiry and skills: Evaluating and reflecting: Evaluate evidence to draw conclusions (ACHASSI129)
- HASS: Inquiry and skills: Evaluating and reflecting: Work in groups to generate responses to issues and challenges (ACHASSI130)
- DRAMA: Explore dramatic action, empathy and space in improvisations, playbuilding and scripted drama to develop characters and situations (ACADRM035)
- ENGLISH: Literacy: Interacting with others: Participate in and contribute to discussions, clarifying and interrogating ideas, developing and supporting arguments, sharing and evaluating information, experiences and opinions (ACELY1709)

Teacher resource:



SECONDARY EDUCATION:

LESSON PLANS: YEARS SEVEN TO TEN

YEAR SEVEN

COASTAL MANAGEMENT TECHNIQUES

Aim:
Develop awareness of a range of views and propose reasons for different perspectives, with a focus on coastal management techniques on the Gold Coast.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
What are coastal management techniques?

Why do we need them on the Gold Coast?

Why does an environmental conservationist think differently to a property developer?

Useful Vocabulary:
Groin, seawall, artificial reef, dunes, sand bypass system, beach nourishment, buffer zones, human impact, changes, ecosystem.

ACTIVITY:

Main Activity:
Divide the class into groups of 5 and give each group 5 words, one per student:

Environmental, Conservation, Activist, Coastal, Management

Individually, students consider the meaning of their word. Choose a colour and an image or symbol to represent each word.

Now work as a group to try and put the words into phrases (2-3 words). What do you think is being described?

Explain that **coastal management** techniques are all the ways we protect our coastline from damage such as erosion.

An **environmental conservation activist** is someone who is passionate about protecting the environment.

Explain a scenario, where a property developer wants to build a new resort on the local beach. Why would they want to do this? What would an environmental activist think of this? Which plants and animals might be affected?

Who else might have an opinion on this situation? (eg local residents, business owners) What do you think?

In groups, choose a coastal management technique from the list below:

- Sea wall
- Beach Nourishment
- Artificial Reef
- Artificial Dunes
- Sand bypass

Research your coastal management technique, what does it involve? How does it work? Write a brief definition in your own words. Share your definition with your group.

Extension task:
What would the environmental activist and property developer think of each of these techniques?

Link(s) to the Australian Curriculum:

- HASS: Knowledge and Understanding: Place and Liveability:

  The influence of environmental quality on the liveability of places (ACHGK045)

  Strategies used to enhance the liveability of places, especially for young people, including examples from Australia and Europe (ACHGK047)

Teacher resources:

- Griffith Information Sheets:

  https://www.griffith.edu.au/__data/assets/pdf_file/0010/333685/Beach-erosion.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0008/322874/History-of-Storms.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0010/322876/Narrowneck-artificial-reef.pdf

YEAR SEVEN

LOOKING AFTER OUR GOLD COAST BEACHES

Aim:
Understand that we are all responsible for looking after the beaches on the Gold Coast and consider what we can do to help.

Prior Knowledge:
Own experience of Gold Coast beaches.

Focus Questions:
Why is it important to preserve our beaches?
Who is responsible for looking after our beaches?

Useful Vocabulary:
Responsibility, liveability.

ACTIVITY:

Introduction:
Imagine life on the Gold Coast if there were no beaches. Make a list of advantages and disadvantages. Overall, does the beach improve the quality of life here?

Main Activity:
Youth 4 Beaches is an organisation created and run by Gold Coast high school student.. As a class, read and discuss the organisation info from facebook (see first image below). The next two images are details of an event run by Youth 4 Beaches. The final image is a poster advertising the event. Read and discuss – how have they made the beach clean up appealing? What devices do they use to encourage people to participate?

Why would a teenager choose to start a group like this?

In groups of 3-4 create your own beach clean up event. What fun activities could you include? How will you advertise? Design a facebook page, poster, etc. This can be done on paper or computer.

Extension task:

What else could your organisation do to improve our beaches? How could you work towards making life on the Gold Coast even better?

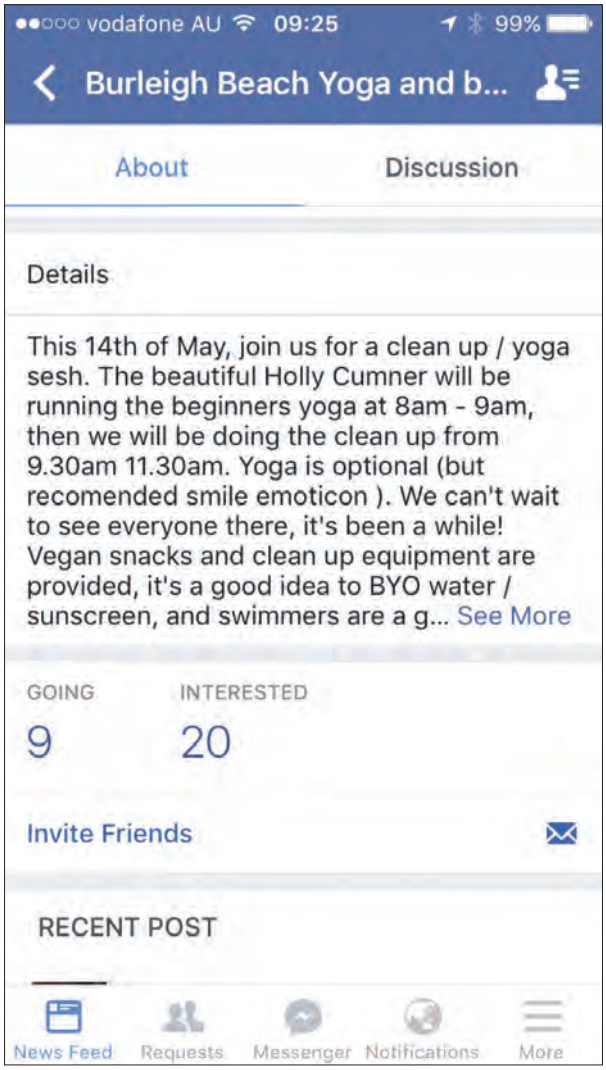
Feedback & Evaluation:

Share all events with the class and decide if you would 'like' each event. For each event consider, is it well planned? How effective is the advertising?

Link(s) to Australian Curriculum:

- GEOGRAPHY: Geographical Knowledge and Understanding: Unit 2: Place and liveability: Factors that influence the decisions people make about where to live and their perceptions of the liveability of places (ACHGK043)

- GEOGRAPHY: Geographical Knowledge and Understanding: Unit 2: Place and liveability: The influence of environmental quality on the liveability of places (ACHGK045)
- GEOGRAPHY: Geographical Knowledge and Understanding: Unit 2: Place and liveability: Strategies used to enhance the liveability of places, especially for young people, including examples from Australia and Europe (ACHGK047)


vodafone AU 09:25 99%
Burleigh Beach Yoga and b...
About
Discussion
Details
This 14th of May, join us for a clean up / yoga sesh. The beautiful Holly Cumner will be running the beginners yoga at 8am - 9am, then we will be doing the clean up from 9.30am 11.30am. Yoga is optional (but recomended smile emoticon). We can't wait to see everyone there, it's been a while! Vegan snacks and clean up equipment are provided, it's a good idea to BYO water / sunscreen, and swimmers are a g... See More
GOING
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20
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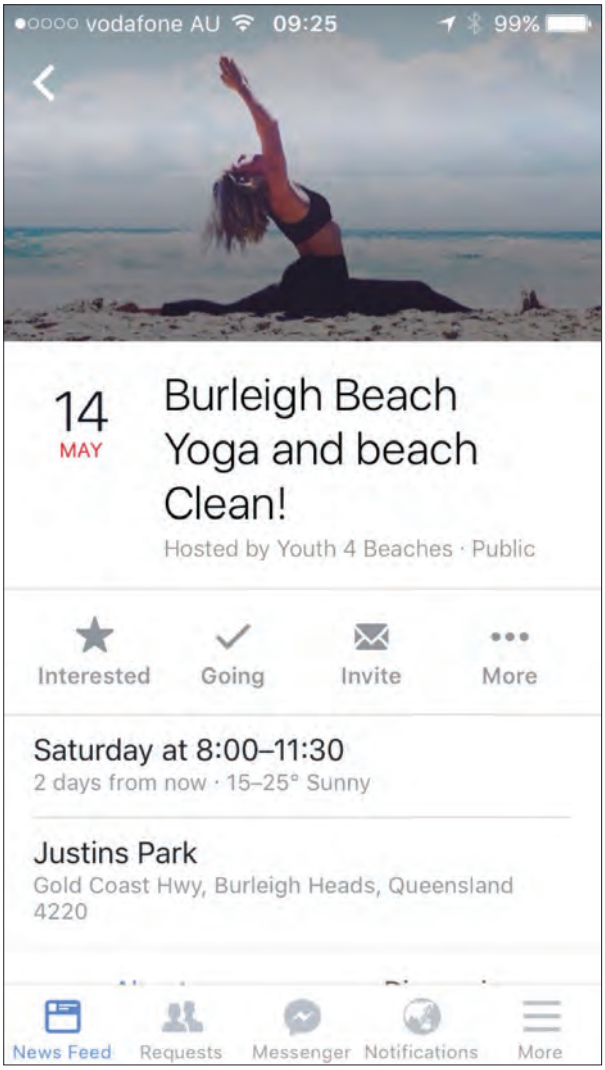
Notifications
More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MAY
Burleigh Beach Yoga and beach Clean!
Hosted by Youth 4 Beaches · Public
Interested
Going
Invite
More
Saturday at 8:00–11:30
2 days from now · 15–25° Sunny
Justins Park
Gold Coast Hwy, Burleigh Heads, Queensland 4220
News Feed
Requests
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YOUTH 4 BEACHES
Join Holly Cumner for a beginners yoga sesh
followed by a beach clean
14th May
Burleigh heads - Justin's Park
Yoga 8am - 9am
Clean-up 9.30am - 11.30am
Bring a yoga mat
(or a towel if you
don't have one)
and your swimmers!

YEAR EIGHT

BUILT ELEMENTS OF THE COASTAL ENVIRONMENT

Aim:
Investigate the effects of the built elements of the coastal environment, such as groins and seawalls.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
What are the built elements of a coastal environment?

Why are they created?

Useful Vocabulary:
Natural, artificial, landscape, protection, urbanisation, groin, seawall, dunes, sand bypass system.

ACTIVITY:

Main Activity:
As a class, examine the image of The Seaway.

Which features are natural? (the Ocean, vegetation, to some extent the sand, although this is often moved and/or added to.)

Which are built or man-made? (the sea walls, the sand bypass system and Wave Break Island, buildings)

In pairs, choose one of the built elements to research – either sea walls, sand bypass systems or Wave Break Island. For each, consider; why are they used? How are they built? How effective are they?

Some pairs can present findings to the class. Discuss which is most effective and why.

Link(s) to Australian Curriculum:

- Geography: Geographical Knowledge and Understanding: Unit 1: Landforms and landscape:
  Investigating the effects of the built elements of environments (for example, urban development, marinas and sea walls) on coastal landscape quality (ACHGK051)

Teacher resource:

- Griffith Information Sheets:
  https://www.griffith.edu.au/__data/assets/pdf_file/0010/333685/Beach-erosion.pdf
  https://www.griffith.edu.au/__data/assets/pdf_file/0016/530044/Caring-for-our-coast_training-walls.pdf
  http://www.goldcoast.qld.gov.au/documents/bf/fs-A-line-Seawall.pdf

YEAR EIGHT

STORM SURGES, CYCLONES AND TSUNAMIS ON THE GOLD COAST

Aim:
Understand the effect of natural hazards such as storm surges, cyclones and tsunamis on the Gold Coast and learn how coastal management techniques work to reduce their impact.

Prior Knowledge:
Own experience of extreme weather events and the impact they can have on our surroundings.

Focus Questions:
What is the effect of storm surges, cyclones and tsunamis on the Gold Coast? What can we do to reduce their impact?

Useful Vocabulary:
Natural hazard, coastal management, storm surge, cyclone, tsunami, erosion

ACTIVITY:

Introduction:
What is a natural hazard? Can you think of any natural hazards that affect the Gold Coast? Storm surges, cyclones and Tsunamis are the most common natural hazards in this area.

Main Activity:
Divide the class into groups and give each group an information sheet – see below.

Use the information on the factsheets to create an infogram or poster about a natural hazard that affects the Gold Coast (storm surge, cyclone or tsunami). Use a maximum of 15 words and as many pictures, images, symbols as you like. Your infogram/poster should be a resource that will enable you to explain what your natural hazard is, how it affects the Gold Coast, what is being done to reduce its impact and any facts or information that interests you.

Extension task:

How do storms affect the ecology of a beach? Information sheet below.

Feedback & Evaluation:

Whole class feedback or pair up the groups and ask them to explain to each other what they have learnt. Then swap until everyone has heard about all of the hazards at least once.

Link(s) to Australian Curriculum:

- GEOGRAPHY: Geographical Knowledge and Understanding: Unit 1 Landforms and landscapes: Geomorphic processes that produce landforms, including a case study of at least one landform (ACHGK050)
- GEOGRAPHY: Geographical Knowledge and Understanding: Unit 1 Landforms and landscapes: Ways of protecting significant landscapes (ACHGK052)
- GEOGRAPHY: Geographical Knowledge and Understanding: Unit 1 Landforms and landscapes: Causes, impacts and responses to a geomorphological hazard (ACHGK053)

Teacher resource:

- Griffith Information Sheets:
  http://www.goldcoast.qld.gov.au/documents/bf/fs-storm-surges.pdf
  http://www.goldcoast.qld.gov.au/documents/bf/fs-cyclones.pdf
  http://www.goldcoast.qld.gov.au/documents/bf/fs-tsunamis.pdf
- Ecology of a Beach Information sheet:
  http://www.goldcoast.qld.gov.au/documents/bf/fs-Ecological-Response-to-Storms.pdf

YEAR NINE

STORM SURGES

Aim:
Learn how to use models to predict changes in population. Use the internet as a research method and evaluate secondary sources of information.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
What are storm surges?

What causes storm surges?

What is their affect on the Gold Coast?

Useful Vocabulary:
Sea level rise, strong onshore winds, erosion, dunes.

ACTIVITY:

Main Activity:
In pairs, read the two information sheets on storm surges (links below).

Draw a model showing how a storm surge works.

Who is the target audience for each text? How can you tell? Which text is most useful for helping you to understand storm surges and how they will affect the population?

Re-read the information on past storm surges. What does this suggest about storm surges in the future? How might they affect the population on the Gold Coast?

Imagine and draw what the Gold Coast might look like after a massive storm surge in2025 at Palm Beach. Discuss how the population might be affected in 2027, two years after the storm surge.

Link(s) to the Australian Curriculum:

- SCIENCE: Science Understanding: Science as Human Endeavour: Nature and development of science:

  Investigating how models can be used to predict the changes in populations due to environmental changes,such as the impact of flooding or fire on rabbit or kangaroo populations. (ACSHE157)
- SCIENCE: Science Understanding: Science Inquiry skills:

  Using internet research to identify problems that can be investigated. (ACSIS164)

  Evaluating information from secondary sources as part of the research process. (ACSIS164)

Teacher resources:

- Griffith Information Sheet:

  https://www.griffith.edu.au/__data/assets/pdf_file/0003/322887/storm-surge.pdf

- Griffith Community Information Sheet:
  https://www.griffith.edu.au/__data/assets/pdf_file/0009/598248/CEMDSS-Storm-Surge-Community-Info-Sheet_Final.pdf
- Griffith Centre for Coastal Management coastal twilight series 1 storm surge and coastal knowledge (1hr 26min)
  https://www.youtube.com/watch?v=mJi5YKjN7tk&list=PLs53dPt8u9lal_YDRljZlmCGLdgMAA0R6&index=3

YEAR NINE

TSUNAMI

Aim:
Examine a range of texts to develop awareness and understanding of Tsunamis.

Prior Knowledge:
No prior knowledge is required.

Focus Questions:
What is a tsunami?

How can we prepare for a tsunami?

Useful Vocabulary:
Tsunami ocean, abnormal waves, epicentre, warning.

ACTIVITY:

Main Activity:
What is a Tsunami? Brief discussion, then watch the tsunami video (3.5 mins, link below). Create a class definition.

Either in pairs or as a class, look at the Griffith Information sheet (link below). How have tsunamis affected the Gold Coast?

Use the information sheet and the City of Gold Coast Disaster Management web page (links below) to create a leaflet for Gold Coast residents about Tsunamis (informative & persuasive text). The purpose of the leaflet is to raise awareness of what will happen (things to look out for as well as warning systems in place) and how residents should prepare and/or react if a Tsunami (or Tsunami warning) occurs.

Extension task:
Write a diary entry or a story about an imagined Tsunami event on the Gold Coast (imaginative text).

Link(s) to Australian Curriculum:

- ENGLISH: Literacy: Creating texts: Create imaginative, informative and persuasive texts that present a point of view and advance or illustrate arguments, including texts that integrate visual, print and/or audio features (ACELY1746)
- ENGLISH: Literacy: Comprehension strategies: Use comprehension strategies to interpret and analyse texts, comparing and evaluating representations of an event, issue, situation or character in different texts (ACELY1744)

Teacher resources:

- Video: https://www.youtube.com/watch?v=Wx9vPv-T51I
- Griffith Information Sheet:
  https://www.griffith.edu.au/__data/assets/pdf_file/0011/323210/tsunamis.pdf
- City of Gold Coast Disaster Management:
  www.goldcoastcity.com.au/disaster
- Geological and historical records of tsunami in Australia:
  http://www.geosci.usyd.edu.au/users/prey/Teaching/Geos-2111GIS/Tsunami/Dominey-Howes-MarGeology07-TsunamiAustralia.pdf

YEAR NINE - TSUNAMI QUESTION SHEET

1. How is an earthquake caused?

2. What does a tsunami have to do with an earthquake?

3. What makes the tsunami so dangerous and powerful? (Think about the cause of the tsunami and the resulting wave movements)

4. What else other than an earthquake can cause a tsunami?

5. How far can a tsunami travel?

6. Why does the height of a tsunami grows when it hits the coast?

7. What protection implementation are in place?

8. What should you do in case of an earthquake and a tsunami?

YEAR TEN

DUNES AND THE FUTURE OF THE GOLD COAST

Aim:
Develop understanding of the importance of Dunes to the Gold Coast and how human interaction can impact the success or failure of our Dunes.

Prior Knowledge:
Experience of Gold Coast beaches and dunes.

Focus Questions:
What is a Dune?
Why are Dunes important?
What challenges do they face?
What can we do to protect the Dunes?

Useful Vocabulary:
Dune, erosion, coastal management, native species

ACTIVITY:

Introduction:
What are dunes? Create a class definition.
Option to use factsheets (see below).
Draw a diagram of a dune. See example below.
Watch the Dune Management video (13.5min) (see below).

Main Activity:
Divide the class into pairs. Give each pair a question:

How does weather affect the dunes?
How do people have a positive impact on the dunes?
How do people have a negative impact on the dunes?
How does vegetation support the dunes?
Why does it matter if the dunes are eroded?
What can we do to protect the dunes?

Research your question.

Put pairs who researched the same question into groups of 4. Share your research and plan a presentation to explain your findings to the class.

Extension task:
Consider the different impact of native and invasive species on the dunes.

Feedback & Evaluation:
How is the success of the dunes linked to the success of the Gold Coast? No dunes = unprotected, damaged beaches. How would this affect the area? Would it still be a popular tourist destination? Would people still want to live there?

Who has caused most of the challenges faced by dunes? Humans – litter, trampling, developments too close to the beach, etc.

Who will be most affected if the dunes disappear?

Who has the power to change things?

Extension task:
Use the information you have gathered as a class to create a poster designed to persuade people to help protect the dunes. This could be by not trampling, collecting litter or joining a local Dunewatch group. Consider target audience – eg local residents or tourists visiting the area.

Link(s) to the Australian Curriculum:

- GEOGRAPHY: Knowledge and Understanding: Environmental change and management:

  Human-induced environmental changes that challenge sustainability (ACHGK070) Environmental world views of people and their implications for environmental management (ACHGK071)

  The application of geographical concepts and methods to the management of the environmental change being investigated (ACHGK074)

  The application of environmental economic and social criteria in evaluating management responses to the change (ACHGK075)

Teacher resource:

- Griffith Information Sheets:

  https://www.griffith.edu.au/__data/assets/pdf_file/0005/322871/Dunes-of-the-Gold-Coast.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0005/322790/Looking-after-our-dunes.pdf
- Dune management video:

  https://www.youtube.com/watch?v=ujKk8KeyFh8

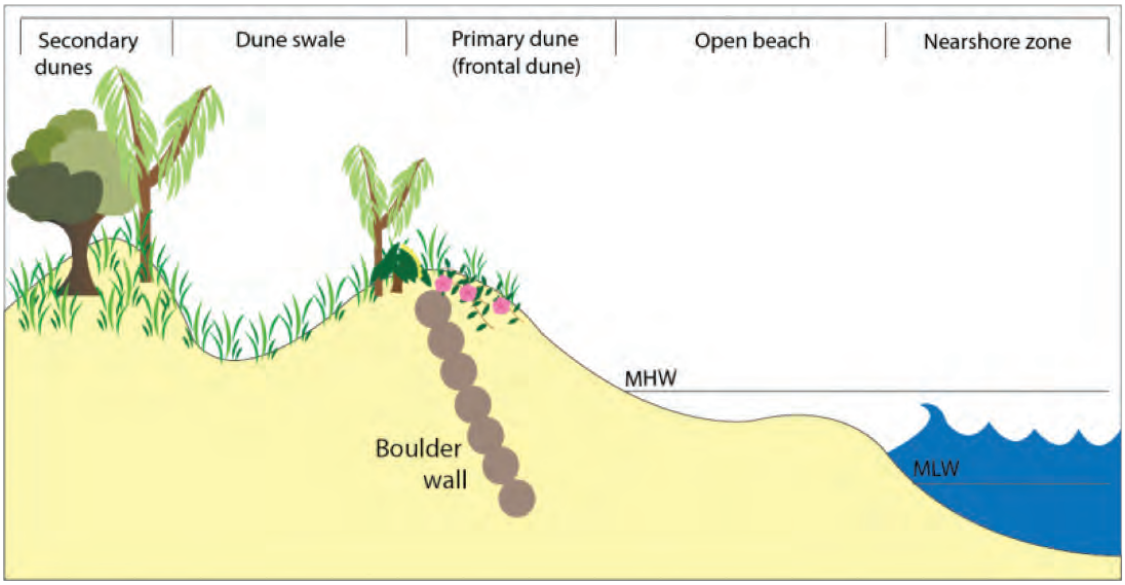


Figure 1. A Gold Coast dune profile

YEAR TEN

ENVIRONMENTAL CHANGE AND MANAGEMENT

Aim:
Understand sand erosion and longshore drift. Research and evaluate the coastal management techniques being used at Narrowneck.

Prior Knowledge:
Own experience of Narrowneck and/or the Gold Coast, possible understanding of erosion.

Focus Questions:
What are coastal management techniques?

Which techniques are most effective?

How do we decide which techniques to use?

Useful Vocabulary:
Erosion, longshore drift, coastal management, artificial

ACTIVITY:

Introduction:
Divide the class into pairs. Each pair is given a phrase from this list:

Sand erosion, longshore drift, coastal management techniques, artificial reef. Find/create a definition for the phrase you have been given.

Class feedback – use ideas from all pairs that had the same phrase to create a class definition for each phrase.

How do erosion and longshore drift affect the Gold Coast? Explain that coastal management techniques are used to mitigate the negative effects.

Main Activity:
Create a case study for the Narrowneck area, ensuring you answer the following questions:

What were the challenges faced by the area?

How have they been addressed?

What Coastal management techniques have been used?

How have they been implemented and how successful have they been?

Students can use the internet to research, you can also provide factsheets to assist as well as a short video (4mins) (see below).

Case studies should be presented as a report, including images and diagrams to demonstrate findings.

Extension task:
What other coastal management techniques can be used? Research and evaluate, which are the best choices? (eg sea walls, groynes, artificial dunes and dune management, sand bypassing)

Feedback & Evaluation:
How successful are the coastal management techniques at Narrowneck? What factors affect the decision of which techniques to use? Is it more than just which is most effective? (consider cost, available resources, social implications, etc)

Link(s) to Australian Curriculum

- Geography: Geographical Knowledge and Understanding Unit 1 Environmental change and management:

  Human-induced environmental changes that challenge sustainability (ACHGK070)

- Geography: Geographical Knowledge and Understanding Unit 1 Environmental change and management:

  Environmental world views of people and their implications for environmental management (ACHGK071)

- Geography: Geographical Knowledge and Understanding Unit 1 Environmental change and management:

  The application of geographical concepts and methods to the management of the environmental change being investigated (ACHGK074)

- Geography: Geographical Knowledge and Understanding Unit 1 Environmental change and management:

  The application of environmental economic and social criteria in evaluating management responses to the change (ACHGK075)

Teacher resources:

- Griffith Information Sheets:

  https://www.griffith.edu.au/__data/assets/pdf_file/0004/322771/NGCBPS-Beach-Width.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0010/322876/Narrowneck-artificial-reef.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0010/333685/Beach-erosion.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0009/322875/Longshore-drift.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0017/322730/Gold-Coast-beach-nourishment.pdf

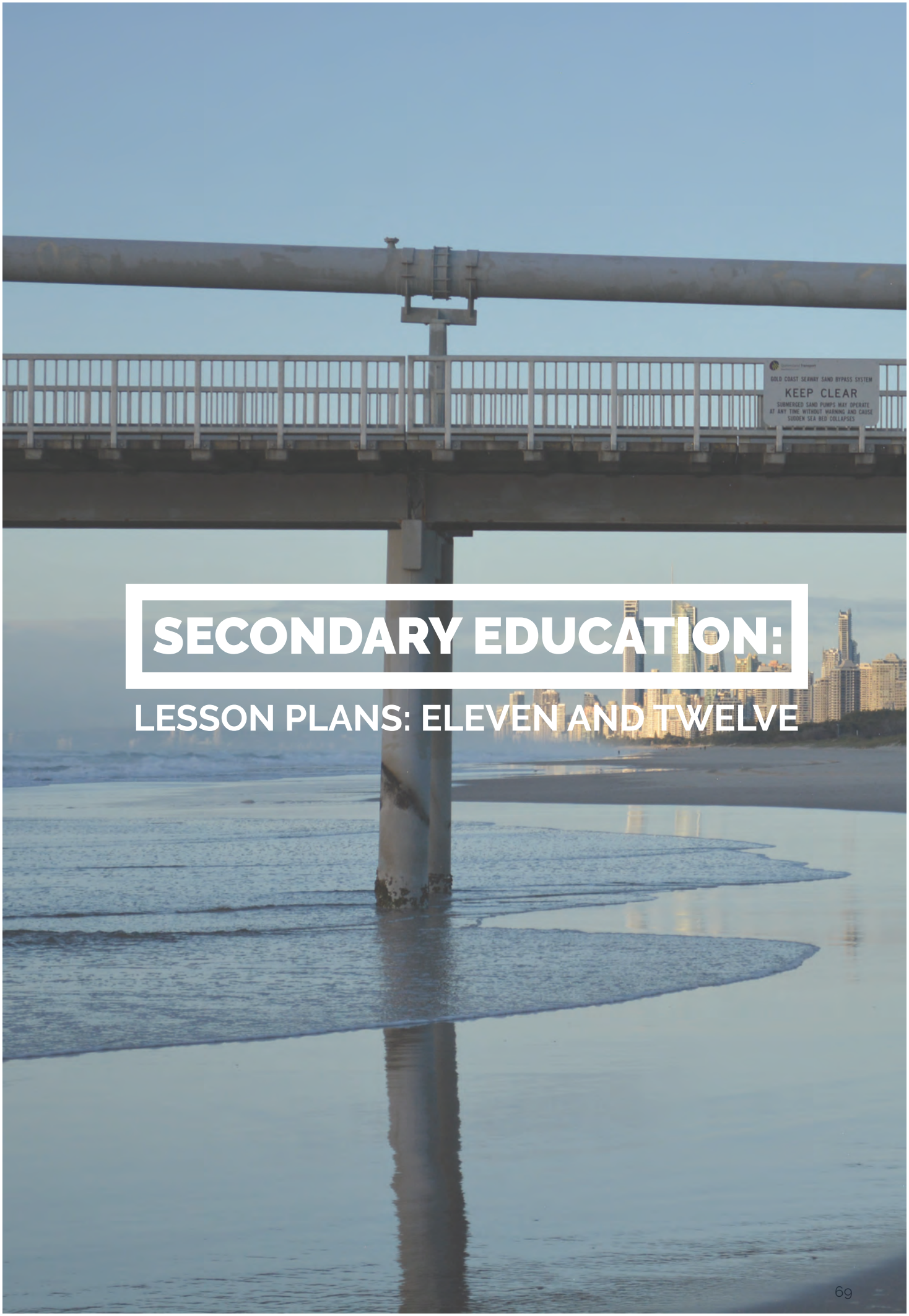
  https://www.griffith.edu.au/__data/assets/pdf_file/0016/530044/Caring-for-our-coast_training-walls.pdf

  https://www.griffith.edu.au/__data/assets/pdf_file/0005/322871/Dunes-of-the-Gold-Coast.pdf\

  https://www.griffith.edu.au/__data/assets/pdf_file/0005/322790/Looking-after-our-dunes.pdf

- Narrowneck reef video:

  https://www.youtube.com/watch?v=oUfLGStUKPs



SECONDARY EDUCATION:

LESSON PLANS: ELEVEN AND TWELVE

GEOGRAPHY: UNIT 2

SUSTAINABLE PLACES RESOURCES

Aim:
The resources provided will facilitate students developing a depth study investigating the challenges faced by the Gold Coast area and the ways these challenges are being addressed. Activities will demonstrate potential methods of collecting primary data and provide sources of secondary data.

Prior knowledge:
Own experience of the beach and how the coastal environment is affected by Tourism and Development.

Previous Coastal education, eg CoastEd sessions or lessons.

Focus questions:
What are the challenges faced by the Gold Coast area? How does Tourism and Development affect the Gold Coast area? How are these challenges being addressed?

Useful vocabulary:
Tourism, sustainability

NOTES: All lessons are flexible and it may take more than one hour to effectively complete the activities, according to the needs and abilities of the students. Teachers may choose to teach one or more of the lessons, in any order. Options are provided for extending or simplifying tasks.

Links to the Australian Curriculum:

Geographical Inquiry and Skills

- OBSERVING, QUESTIONING AND PLANNING

  Formulates geographical inquiry questions (ACHGE028)

  Plans a geographical inquiry with clearly defined aims and appropriate methodology (ACHGE029)
- COLLECTING, RECORDING, EVALUATING AND REPRESENTING

  Collects geographical information incorporating ethical protocols from a range of primary and secondary sources (ACHGE030)

  Records observations in a range of graphic representations using spatial technologies and information and communication technologies (ACHGE031)

  Evaluates the reliability, validity and usefulness of geographical sources and information(ACHGE032)
- INTERPRETING, ANALYSING AND CONCLUDING

  Analyses geographical information and data from a range of primary and secondary sources and a variety of perspectives to draw reasoned conclusions and make generalisations (ACHGE033)

  Identifies and analyses relationships, spatial patterns and trends and makes predictions and inferences (ACHGE034)
- COMMUNICATING

  Communicates geographical information, ideas, issues and arguments using appropriate written and/or oral, cartographic and graphic forms (ACHGE035)

Uses geographical language in appropriate contexts to demonstrate geographical knowledge and understanding (ACHGE036)

- REFLECTING AND RESPONDING

  Applies generalisations to evaluate alternative responses to geographical issues at a variety of scales (ACHGE037)

  Proposes individual and collective action, taking into account environmental, social and economic factors; and predicts the outcomes of the proposed action (ACHGE038)

Geographical Knowledge and Understanding

- OVERVIEW OF PLACES AND THEIR CHALLENGES

  PLACES:

  The process of urbanisation, its implications for world population growth, human wellbeing and urban and rural places. (ACHGE039)

  The changing demographic characteristics and economic functions of metropolitan, regional, rural and remote places in Australia. (ACHGE042)

  CHALLENGES FACING PLACES:

  An overview of challenges in metropolitan and regional cities in Australia. (ACHGE044)

- DEPTH STUDY OF CHALLENGES FACING A PLACE IN AUSTRALIA

  The nature, scope and causes of the selected challenges being confronted and the implication for the place (ACHGE046)

  The range of strategies used to address the selected challenges and how these compare with, and/or have been informed by, responses implemented in other places both within and outside of Australia (ACHGE047)

  The extent to which the strategies adopted have been, or could be, informed by the concept of sustainability (ACHGE048)

  The strategies adopted and an assessment of how these have enhanced the sustainability and liveability of the place. (ACHGE049)

LESSON ONE

OUR CHANGING GOLD COAST BEACHES

Aim:
Process of urbanisation, its implications for world population growth, human wellbeing and urban and rural places. (ACHGE039)

The changing demographic characteristics and economic functions of metropolitan, regional, rural and remote places in Australia. (ACHGE042)

Introduction:
Warm up question: How many Gold Coast beaches can you name?

Show selection of images from http://www.goldcoast.qld.gov.au/a-day-at-the-beach-9670.html (see below). Can students guess where and when each image was taken? Discuss how beaches have changed. Why do beaches change?

How has the Gold coast area (not just the beach) changed in the last 100 years? How could we measure the changes? What questions could we ask – eg, how many residents, how many tourists, number of businesses, etc

Option to explore the history of beach culture on the Gold Coast:
Gold Coast Beach Culture (PDF 476kb)

Main Activity:
Divide the class into pairs and give each pair a beach/suburb to research. Students should focus on finding out how their area has changed in the last 100 years, answering as many questions as possible from the introduction. Students should also explore which coastal management techniques (eg sand nourishment, sea walls, man-made dunes, etc) are used on each beach. They may use a mixture of words and images to show their findings in a brief powerpoint presentation.

- Bilinga
- Broadbeach
- Burleigh Heads
- Coolangatta
- Currumbin
- Greenmount
- Kirra
- Main Beach
- Mermaid Beach
- Miami
- Narrowneck
- Nobby Beach
- North Burleigh
- North Kirra
- Palm Beach
- Rainbow Bay
- Tallebudgera
- Tugun
- South Stradbroke Island
- Surfers Paradise

Extension task:
What are the main challenges faced by the Gold Coast area? What can be done to address them?
Consider how your area will change in the next 100 years. What factors might affect this?

Feedback & Evaluation:
Each pair shares their findings with the class.

Surfers Paradise - 1950s © Gold Coast City Council

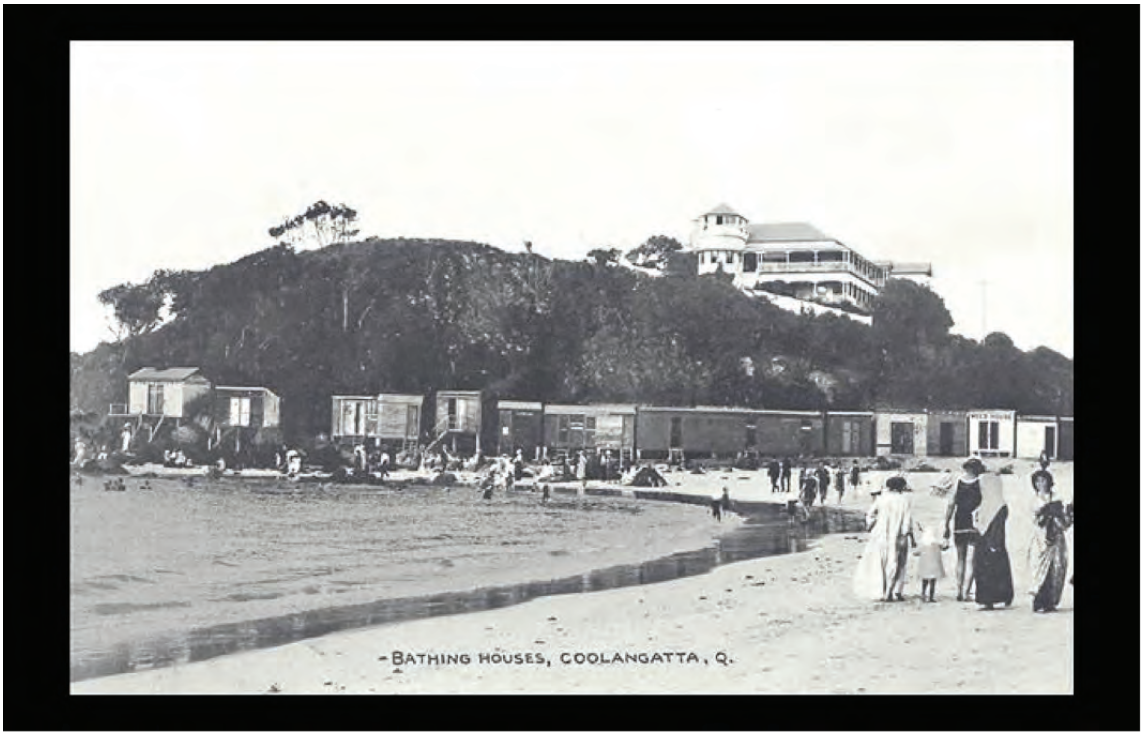
Northcliffe - 1979 © Gold Coast City Council

Main Beach - 1930s © Gold Coast City Council

Kirra - 1939 © Gold Coast City Council

Coolangatta - 1885 © Gold Coast City Council

Burleigh Heads - 1888 © Gold Coast City Council



Greenmount - 1900s © Gold Coast City Council

Southport - 1920 © Gold Coast City Council

LESSON TWO

WHAT IS THE GOLD COAST WORTH?

Aim:
Analyse geographical information and data from a range of primary and secondary sources and a variety of perspectives to draw reasoned conclusions and make generalisations (ACHGE033)

Identify and analyse relationships, spatial patterns and trends and makes predictions and inferences (ACHGE034)

Communicate geographical information, ideas, issues and arguments using appropriate written and/or oral, cartographic and graphic forms (ACHGE035)

Introduction:
How can we measure the value of the Gold Coast? Consider the activities that take place on our beaches.

Main Activity:
Divide the class into groups and give each group a factsheet:

How the community value Gold Coast beaches PDF(228kb)

The economic value of surfing on the Gold Coast PDF(238kb)

The value of beach recreation on the Gold Coast PDF(366)

In groups examine the data on your fact sheet (graphs, charts, tables, statistics). What conclusions or statements can you make based on this data?

Read the information and create a poster summarising your factsheet. Option to limit wordcount (eg 15 words) to encourage creative thinking. Present your findings to the class.

Extension task:
SWOT analysis of the Gold Coast – consider strengths, weaknesses, opportunities and threats to tourism on the gold coast.

Feedback & Evaluation:
How confident do you feel that you could measure the value of the Gold Coast? What further information or resources might you need to do this effectively?

LESSON THREE

THE CHALLENGE OF TOURISM AND DEVELOPMENT

Aim:
The nature, scope and causes of the selected challenges being confronted and the implication for the place (ACHGE046)

Introduction:
Examine the image of a proposed Gold Coast development (see below). Explain to the class that a (fictional) company, Worldwide Hotels Inc., wants to build a new apartment building with luxury facilities on the Gold Coast.

Brief class discussion – Do you think this is a good idea? Why? Who will be affected?

Main Activity:
Divide the class into groups of 4 or 5 students. Give each student a role within the group.

Resident (in groups of 5 students, there can be 2 residents, 1 adult, 1 child.) You live and work in the area.

Tourist You visit the area for your holidays every year.

Developer Your company wants to build a new apartment building with luxury facilities on the Gold Coast.

Environmentalist You are concerned about protecting the local environment, including animals, plants and their habitats.

Individual thinking time. Students may write or record their ideas in any way they find helpful.
Instructions for students:

1. Consider your character's situation.
2. What might the advantages of a new development be for your character?
3. What might the disadvantages of a new development be for your character?
4. Do you want the development to go ahead?
5. How will you persuade others to agree with you?

Group discussion. Staying 'in character', take it in turns to explain your opinion to the rest of the group. Once each person has spoken, the rest of the group may ask questions.

Extension task:
Decide if you think the new development is a good idea. Vote within your group.

What other challenges does the Gold Coast area face?

Feedback & Evaluation:
What were the most persuasive arguments for and against the new development?

Should the development go ahead? Whole class vote.

LESSON FOUR

HOW IS THE GOLD COAST ADDRESSING THE CHALLENGES IT FACES?

Aim:
The nature, scope and causes of the selected challenges being confronted and the implication for the place (ACHGE046)

The range of strategies used to address the selected challenges and how these compare with, and/or have been informed by, responses implemented in other places both within and outside of Australia (ACHGE047)

Introduction:
What are the challenges? In groups of 3, create a mind map to show your ideas, using the following headings:

- Economic
- Environmental
- Social

Share ideas as a class and add to your mind map.

Main Activity:
In your groups, take a topic each (economic, environmental, social) and research how these challenges are being addressed. What is the City of Gold Coast doing? Are any other groups providing solutions?

You may also use your research from lesson 1, such as Coastal Management techniques that are being used on Gold Coast Beaches.

Extension task:
How effective are these strategies? How do they compare with responses implemented elsewhere?

Feedback & Evaluation:
Class feedback and discussion – to what extent are the challenges faced by the Gold Coast being effectively addressed?

LESSON FIVE

WHAT'S THE PLAN FOR THE GOLD COAST?

Aim:
Consider the changing demographic characteristics and economic functions of metropolitan, regional, rural and remote places in Australia. (ACHGE042)

Introduction:
What is the Destination Tourism Management Plan?

TASK 1:

As a class, read and discuss the explanation below:

Destination Tourism Management Plan
City of Gold Coast together with Gold Coast Tourism Corporation have worked together to develop a Destination Tourism Management Plan (DTMP) for the Gold Coast.

Residents, visitors and stakeholders were invited to have their say between 18 October and 1 November 2013 on how the Gold Coast can continue to evolve as a world class tourism destination.

Feedback and responses were used to develop the Destination Tourism Management Plan that was completed in May 2014.

The DTMP aims to set the future direction for tourism on the Gold Coast to 2023, define its key themes and work out the necessary strategies in an effort to improve and grow the city's tourism economy.

It identifies short and long term actions to ensure tourism remains compelling, competitive and sustainable. The plan also includes priority projects centring on the beach, our events, entertainment and the hinterland. It also leverages opportunities arising from the Gold Coast 2018 Commonwealth Games™.

Source: http://www.goldcoast.qld.gov.au/council/destination-tourism-management-plan-19557.html

TASK 2:

Individually or in pairs, read the overview below and rewrite in your own words:

The Gold Coast Destination Tourism Management Plan Overview

2020 Target

Double overnight visitor expenditure to $7 billion by 2020 1.

Growth Imperatives

1. A more aggressive acquisition strategy to attract and grow mass participation and hallmark events
2. More overnight visitors through a growth in new experiences to identified niches (culture, outdoor and nature based)
3. 3. Increased market share, length of stay, expenditure and conversion of overnight visitors through demand driving destination marketing
4. Increased investment in tourism related product, experiences and services
5. Direct aviation access to the Chinese market

Vision Statement

One vision and one voice to guide the future development and delivery of tourism on the Gold Coast to 2020.

Source: http://www.goldcoast.qld.gov.au/documents/bf/destination-tourism-management-plan.pdf

Main Activity:
Read the statements from Tom Tate and Paul Donovan (below). Highlight/underline any positive words or phrases that are used to describe the Gold Coast and its current situation. The first few have been done for you.

What do you notice about the language both statements use? Are there similarities? Are there any differences?

Extension task:
Read the report and summarise what is being suggested. Will the strategies be effective?

Feedback & Evaluation:
Is the DTMP an effective way to address the challenges being faced by the Gold Coast? If you think it is, explain why. If you think it isn't, how could it be improved?

MAYOR TOM TATE

MAYOR TOM TATE, CITY OF GOLD COAST

As Australia's premier tourism destination, the Gold Coast is 'open for business' and ready to grow our tourism dollar in order to retain the city's significant status in the tourism market.

Famous for sun, surf and sand, the city offers a vibrant mix of shopping, accommodation, theme parks, golf courses, restaurants, entertainment and an abundance of natural attractions for all to enjoy - including beaches and waterways to the east and stunning hinterland ranges and forests to the west.

It is no wonder then that the city welcomes 12 million visitors each year, sustaining 30,000 jobs and adding $4.6 billion to the local economy. Strong tourism for the Gold Coast means prosperity for the city, which means more local jobs.

It is crucial that the Gold Coast retains its enviable status as a world-class tourism destination. To ensure the city continues its growing popularity as a holiday destination, we realise we need to do more.

As recent decades have shown, key visitor markets change and grow, so we need to adapt our tourism offerings and experiences. This means attracting new and exciting events and investment into our city. The catalyst projects included in this Plan are:

- The Gold Coast Cultural Precinct;
- Integrated Resort Developments;
- Commonwealth Games infrastructure;
- Staging and events infrastructure for iconic locations;
- A purpose-built dive attraction;
- Mountain bike and adventure trails;
- An iconic surf museum;
- Light rail connections.

The Destination Tourism Management Plan is an important collaboration between the City of Gold Coast, Gold Coast Tourism and the State Government that acknowledges these needs and lays out the direction for the future long-term success of tourism in the city.

This Plan capitalises on our key opportunities and aligns the City's plans with state and national strategies to deliver on our ambitious 2020 target of doubling visitor expenditure.

It addresses the needs of the broader visitor economy in the Gold Coast region and aims to build on a strong foundation which acknowledges the vital demand-side destination marketing undertaken by Gold Coast Tourism, by aligning the resources and efforts of industry and all levels of government towards a set of unified long-term objectives and outcomes.

Let me take this opportunity to thank all those involved in the development of this Plan and I look forward to realising its ambitious, but achievable goals.

Source: http://www.goldcoast.qld.gov.au/documents/bf/destination-tourism-management-plan.pdf

PAUL DONOVAN

PAUL DONOVAN, CHAIRMAN OF GOLD COAST TOURISM

The Gold Coast Destination Tourism Management Plan (DTMP) is a milestone commitment between the Gold Coast tourism industry, the City of Gold Coast and the Queensland government.

It underpins our partnership, provides a framework to achieve our challenging shared goal of doubling the Gold Coast visitor economy by 2020, and affirms our intent to maintain our position as Australia's most successful, robust, and productive tourism region.

Notwithstanding the region's unrivalled variety of natural and man-made attractions, the Gold Coast must now compete more effectively against an unprecedented array of active and accessible tourism destinations. Only through an aggressive Gold Coast DTMP framework that clarifies our vision, aligns our efforts, develops the industry, and drives increased demand can we succeed.

The Plan prescribes a partnership of accountability and responsibility that will deliver the supply and demand drivers for the Gold Coast's most significant economic pillar. Close alignment of Gold Coast Tourism's best practice destination marketing with the City of Gold Coast's tourism investment and development activities will deliver wide-ranging benefits throughout the local economy.

On behalf of the Gold Coast tourism industry I am excited about the benefits this unified, action based, and outcome driven plan will deliver.

Source: http://www.goldcoast.qld.gov.au/documents/bf/destination-tourism-management-plan.pdf

LESSON SIX

SUSTAINABLE STRATEGIES

Aim:
The extent to which the strategies adopted have been, or could be, informed by the concept of sustainability (ACHGE048)

The strategies adopted and an assessment of how these have enhanced the sustainability and liveability of the place. (ACHGE049)

Introduction:
What is sustainability?

Can you think of a colour, symbol and image to represent sustainability? Think, pair, share - Give individual thinking time, then discuss with the person next to you, followed by whole class discussion. Agree and record a class definition of sustainability.

Option to use sustainability factsheet to support discussion:

http://www.coolaustralia.org/wp-content/uploads/2014/10/Sustainability-primary.pdf

Main Activity:
How can you assess whether sustainability is a factor when deciding on strategies for addressing challenging facing the Gold Coast?

Open the DTMP document and press control and F to use the find function to establish how many times the words sustainable or sustainability are used. What does this suggest about sustainability?

Now consider all of the strategies identified in previous lessons. In pairs, choose a selection of strategies (3-5) and explore how sustainability might have featured in decision making for each of them.

Extension task:
Work with another pair to discuss the research process and compare findings.

Feedback & Evaluation:
Each pair presents key findings to the class. Discuss; to what extent are strategies adopted on the Gold Coast informed by sustainability?

LESSON SEVEN

EXISTING DATA

Aim
Analyses geographical information and data from a range of primary and secondary sources and a variety of perspectives to draw reasoned conclusions and make generalisations (ACHGE033)

identifies and analyses relationships, spatial patterns and trends and makes predictions and inferences (ACHGE034)

Introduction:
Review the data on pages 8-15 of the DTMP. What conclusions can you draw based on this data? What statements can you make?

Main Activity:
Review the data in this document:

http://teq.queensland.com/~/media/9D5A7504494F4CFC8ABC0AC37202825D.ashx

Create a SWOT analysis for the tourism industry on the Gold Coast. What strategies would you recommend to the City of Gold Coast to develop the tourism industry?

Extension task:
Imagine you are the sustainability officer for City of Gold Coast. What recommendations would you make based on the tourism data?

Feedback & Evaluation:
Share recommendations with the class. As a Gold Coast resident, is each recommendation something you would want to be implemented?

LESSON EIGHT

FORMULATE YOUR QUESTION AND PLAN YOUR INVESTIGATION

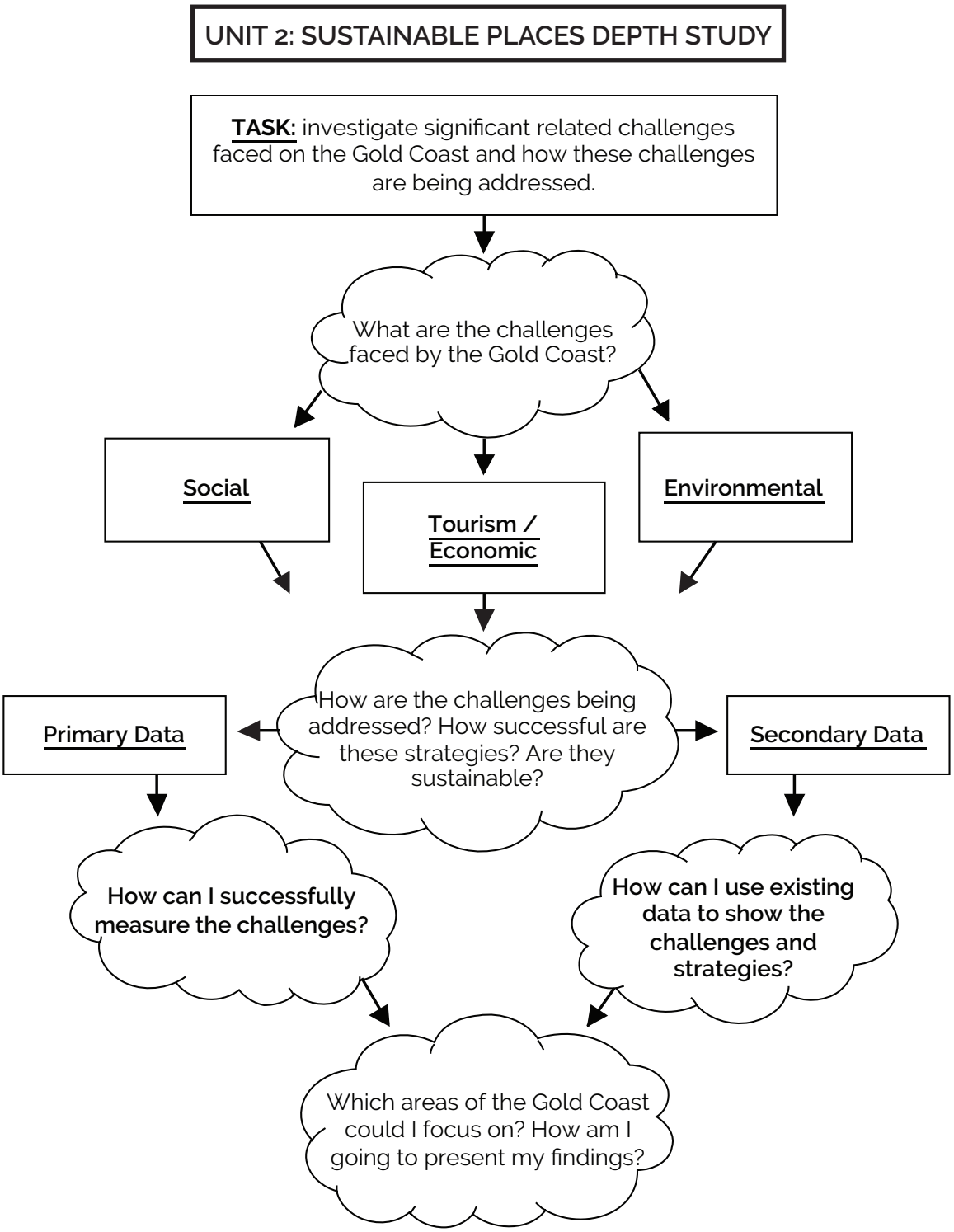
Aim:
Formulates geographical inquiry questions (ACHGE028)
Plan a geographical inquiry with clearly defined aims and appropriate methodology (ACHGE029)

Introduction:
How can we measure the impact of tourism and development on our coastline? Where might we find existing data? What do we call these types of data? (Primary/secondary data) Why are both important?
Can you think of a possible focus question?

Optional prompt:
Your question could have a Commonwealth Games theme, aiming to investigate the challenges faced by the Gold Coast area in the run up to the games and the strategies used to address them.
How will you create primary data? What secondary data might be useful? Share ideas with the class.

Main Activity:
Use the infographic to create a focus question and plan your depth study.

Feedback & Evaluation:
Explain your question and plan to the person next to you. Discuss strengths and weaknesses of each other's ideas. Can you suggest any improvements?


UNIT 2: SUSTAINABLE PLACES DEPTH STUDY
TASK: investigate significant related challenges faced on the Gold Coast and how these challenges are being addressed.
What are the challenges faced by the Gold Coast?
Social
Tourism / Economic
Environmental
How are the challenges being addressed? How successful are these strategies? Are they sustainable?
Primary Data
Secondary Data
How can I successfully measure the challenges?
How can I use existing data to show the challenges and strategies?
Which areas of the Gold Coast could I focus on? How am I going to present my findings?

BONUS LESSON

GOLD COAST COMMONWEALTH GAMES 2018

Aim:
The changing demographic characteristics and economic functions of metropolitan, regional, rural and remote places in Australia. (ACHGE042)

An overview of challenges in metropolitan and regional cities in Australia. (ACHGE044)

The nature, scope and causes of the selected challenges being confronted and the implication for the place (ACHGE046)

The range of strategies used to address the selected challenges and how these compare with, and/or have been informed by, responses implemented in other places both within and outside of Australia (ACHGE047)

The extent to which the strategies adopted have been, or could be, informed by the concept of sustainability (ACHGE048)

The strategies adopted and an assessment of how these have enhanced the sustainability and liveability of the place. (ACHGE049)

Introduction:

What is the Commonwealth?

(Answer: The Commonwealth is a name for countries which were part of the British Empire before they became independent. This group of states works together on many important matters, like business, health and the fight against poverty. There are 53 Commonwealth countries including Australia, Canada, New Zealand, Kenya, Malasia, Pakistan and the UK.)

What is the Commonwealth Games?

(Answer: The Commonwealth Games is a multinational, multi-sport event. Held every four years, it involves the elite athletes from Commonwealth countries. Attendance at the Commonwealth Games is typically around 5,000 athletes.)

The Gold Coast 2018 Commonwealth Games will feature 17 sports. Can you name them all?

(Answer: Athletics, Aquatics (swimming and diving), Badminton, Basketball, Boxing, Cycling, Gymnastics, Hockey, Lawn Bowls, Netball, Rugby Sevens, Shooting, Squash, Table Tennis, Triathlon, Weightlifting, Wrestling.)

Main Activity:
Use the Premier's message, Minister's message and Mayor's message (see below). Working in pairs, give each pair a message to work with. They should then address the following:

1. Read the message, highlight/underline any words you're not sure of and find out their meaning.
2. What opportunities for the Gold Coast are suggested?
3. What challenges for the Gold Coast are suggested?
4. What strategies are suggested for addressing these challenges?

Class feedback on each of the messages. Class discussion – are the messages similar? In what ways are they different? Why might that be? What different motivations might be behind each message? Is the message effective?

Extension task:
Visit http://aheadofthegames.embracing2018.com/

Scroll down the page and click on the section titled Embracing 2018. Read and review information, in pairs or as a class.

Divide the class into 7 groups, give each group a section from the page http://aheadofthegames.embracing2018.com/ to explore:

- Arts and Culture
- Transport
- The Commonwealth
- Venues
- Financial Overview
- Opportunities for Business
- Games Partners

Read and summarise information before presenting your ideas to the class to the class.

Consider the following questions:

- What opportunities are provided by GC2018?
- What challenges are created? What strategies are being used to address these challenges?
- Is there any evidence that sustainability has been taken into consideration?
- How will the changes outlined affect the liveability of the area?
- Is there any evidence that strategies take into consideration the ways other countries have dealt with similar challenges?

Feedback & Evaluation:
Which areas provide the most opportunity? What are the most important challenges? Do you think the GC2018 Games will be a success? Why?

http://aheadofthegames.embracing2018.com/gc2018

http://www.embracing2018.com/page/Our_Legacy_Stories/Schools_embrace_GC2018/

http://education.qld.gov.au/learningplace/events/gc2018.html

http://aheadofthegames.embracing2018.com/pdfs/embracing_2018_action_plan_2015.pdf

http://aheadofthegames.embracing2018.com/pdfs/queenslands_legacy_for_the_Gold_Coast_2018_Commonwealth_Games.pdf

PREMIER'S MESSAGE

The Honourable Annastacia Palaszczuk MP

Premier and Minister for the Arts

The Gold Coast 2018 Commonwealth Games will deliver a significant economic and community legacy for Queensland and the Gold Coast in particular.

We can already see the transformational impact GC2018 is having on the region in this progress update.

All three new sporting venues and one multi-use facility at Oxenford's Village Roadshow Studios are scheduled for completion in 2016. Plans are well advanced for work to start on seven upgraded venues, all due to open for community use 12 months out from the Games.

Construction of the new venues and upgrades are delivering 1000 full-time equivalent jobs for Queenslanders. But the flow-on effects across the wider community cannot be underestimated, with thousands more workers benefiting along the broader supply chain supporting these projects.

Long-term, the $320 million venue construction program, jointly funded by the Queensland Government, the Australian Government and the City of Gold Coast, will ensure the Gold Coast and South East Queensland are positioned as pre-eminent hosts of major events and enviable locations to live, visit and invest in.

Our progress towards delivering the Games on time and on budget was acknowledged in December 2015 by the Commonwealth Games Federation (CGF) Coordination Commission.

The CGF confirmed the plans we have put in place and the work undertaken by the Queensland Government and our delivery partners has put the Gold Coast in a great position to deliver the best Games ever.

The Gold Coast 2018 Commonwealth Games is an event that will place our state on the world stage and a cumulative audience of 1.5 billion people will be watching. My Government is determined that every opportunity is taken to build a lasting legacy that will create jobs, build our economy, strengthen our community and enhance our already enviable Queensland lifestyle.

Source: http://aheadofthegames.embracing2018.com/

MINISTER'S MESSAGE

The Honourable Stirling Hinchliffe MP

Minister of Transport and the Commonwealth Games

With less than 3 years to go until the Gold Coast 2018 Commonwealth Games, excitement is building as we see new sporting venues rise from the ground, businesses signing on for work, schools interacting with their counterparts around the Commonwealth and our tourism and accommodation providers gearing up to welcome the world.

The Games will be a major economic generator, injecting $2 billion into our economy and supporting 30,000 jobs.

Since the last Ahead of the Games update, we have made a great deal of progress. GC2018 is coming up fast, but the Queensland Government is well and truly on track to deliver the best games ever.

Three brand new sporting venues are taking shape at Coomera, Carrara and Chandler. Local businesses are fabricating steel, pouring concrete and delivering materials. These building sites are already realising a significant economic and community legacy for Queensland, providing jobs for local workers and helping to build a strong, local skills base for future projects.

Our GC2018 venues are already proving they can boost Queensland's reputation as a world class host of major events. In November, the Gold Coast Aquatic Centre hosted the international 2015 FINA Diving Grand Prix, in 2017 the World Badminton Federation Sudirman Cup will be held at Carrara, the Broadbeach Bowls Club will host the 2020 World Bowls Championships, while the Gold Coast has won the 2018 ITU World Triathlon Series Final and World Championships.

These are all important sporting events in their own right and show the lasting legacy we are already generating from GC2018.

But GC2018 is not just about the sport, it's also very much about our community and lifestyle. We recently appointed a creative lead to drive a statewide arts and culture program that will bring colour and excitement to community celebrations in our event cities.

As we count down to GC2018, I encourage all Queenslanders to stay up to date with progress via Ahead of the Games and get behind this amazing opportunity for our State.

Source: http://aheadofthegames.embracing2018.com/

MAYOR'S MESSAGE

Mayor Tom Tate

City of Gold Coast

The Gold Coast 2018 Commonwealth Games™ (GC2018) will showcase our modern city to the world; it will enhance our reputation nationally and internationally, attract investment and opportunity and deliver lasting benefits for our community.

The City of Gold Coast is working closely with the Queensland Government and GC2018 partners to ensure a successful Commonwealth Games for athletes, visitors and locals.

What will make GC2018 memorable will be our people and their warm Gold Coast welcome.

With fewer than 1000 days to go until the biggest sporting event to be held in Australia for a decade, preparations are right on track and construction of more venues is well underway.

There is a growing excitement in the community and a desire to showcase our beautiful city to the world.

GC2018 will be a watershed moment for the Gold Coast and serve as a catalyst for other major civic projects including the Gold Coast Cultural Precinct.

GC2018 will leave behind a profound legacy for our city, including new sporting facilities and transport infrastructure, increased city pride, citizenship and community participation.

We're proud to be working with our partners to host a great Commonwealth Games that delivers lasting benefits for the Gold Coast.

Source: http://aheadofthegames.embracing2018.com/

REPRESENTATION

REPRESENTATION OF GENERAL CAPABILITIES

Literacy
Literacy involves students using their literacy skills to explore, interpret and evaluate geographical phenomena and issues and communicate geographically. Students work with oral, print, visual and digital texts to gather, synthesise and analyse information from a range of sources, and present and justify ideas, conclusions and opinions within a broad range of geographical contexts. They understand how language is used and modified for specific purposes, and question attitudes and assumptions embedded in texts. Students also develop visual literacy skills as they make meaning of information communicated through modes including maps, graphs, cartoons and other images.

Numeracy
Numeracy involves students using numeracy skills to identify and describe a wide range of patterns and relationships, including those that can be visually represented on a graph or map. Students also apply their numeracy skills to interpret and manipulate data. These skills help students to realise and describe change as it occurs over time. Students demonstrate numeracy capability by making connections between apparently diverse facts and suggesting solutions to problems in a range of circumstances, for example, the relationship between weather patterns and the likelihood of natural hazards such as storms or cyclones.

Information and Communication Technology (ICT) capability
Information and Communication Technology (ICT) capability involves students using ICT to develop geographical understanding and support the application of geographical skills. Students use digital tools, including spatial technologies, to support their inquiries into geographical phenomena and issues. They also use these tools to collect and analyse data, represent it in a digital form, access and manipulate databases, and model conceptual constructs. In addition, students critically analyse the quality of digital information and sources of information. They also create multimodal and multifaceted reports and presentations to represent and communicate the results of geographical inquiry.

Students recognise the relative possibilities, limitations and consequences of using different forms of digital information and methods of distributing this information, and apply sophisticated understandings of social and ethical practices in the use of digital information and communications. In particular, they consider how geographical and demographic data may be used and the ethical considerations involved.

Critical and creative thinking
Critical and creative thinking processes and skills are used by students when examining diverse interactions between people, perspectives, interpretations, phenomena and environments. Through multifaceted problem posing and solving they explore the interconnections, uncertainty and consequences of these relationships.

Thinking laterally, visualising possibilities, testing options using criteria, and making judgments are essential skills for conducting geographical investigations connected with the environment, space, sustainability, scale and change. When seeking answers to questions students think holistically and spatially using skills such as analysis, interpretation, extrapolation from trends, synthesis of relationships and exploration of anomalies evident in patterns.

Through developing dispositions such as intellectual openness, curiosity and initiative they investigate

biophysical and human phenomena. As independent and autonomous thinkers who seek explanations and value discovery, students turn creativity and innovation into action, apply new knowledge to identified gaps, and justify their action.

Personal and social capability
Personal and social capability involves students taking responsible personal, social and environmental action against, or in support of, decisions by organisations, governments or other bodies. Through the study of Geography, students are provided with learning opportunities to help them to develop, rehearse and refine their skills in listening to, respecting and acknowledging diverse perspectives and opinions. Students participate in collaborative investigative group-work to make ethical, rational social decisions and solve problems that relate to their social and environmental contexts. Developing these personal and social capabilities positions them positively to advocate for opportunities and methods for change in a democratic society.

Personal and social capability occurs when responsible social and environmental actions and participation are promoted and this should be a logical outcome of many geographical investigations.

Ethical understanding
Ethical understanding plays an important role in geographical inquiry. Students uncover and assess ethical considerations such as the links between human rights and responsibilities and the ways diverse perspectives, values and cultures impact on geographical issues. Through geographical inquiry students have opportunities to analyse, qualify and test their own attitudes, values and beliefs and explore how people's knowledge, attitudes and values affect judgments, decisions and actions as they apply to their interactions with environments. They become aware of the need for social responsibility when confronted with alternative opinions and when seeking to resolve problems. Students apply ethical standards to guide their use of digital representations of phenomena and statistics associated with biophysical and environmental factors and relationships.

Intercultural understanding
Students deepen their intercultural understanding as they examine geographical issues in a broad range of cultural contexts. This involves students in developing their understanding of the complexity and diversity of the world's cultures and evaluating alternative responses to the world's environments and challenges. It enables students to find interconnections and sustainable solutions in an internationally integrated world, and consider the implications of their responses from different cultural responses.

REPRESENTATION OF CROSS-CURRICULUM PRIORITIES:

Aboriginal and Torres Strait Islander histories and cultures
Students are provided with a range of opportunities to learn about Aboriginal and Torres Strait Islander histories and cultures in Geography. They can, for example, investigate how Aboriginal and Torres Strait Islander People may be unequally affected by natural and ecological hazards, are represented in the challenges faced by places, have contributed to land cover change in Australia through their land management practices over time, and have been affected by land cover change and the process of international cultural integration. More broadly, students develop a range of capabilities that enable them to independently construct informed responses to the range of geographical issues involving Aboriginal and Torres Strait Islander Peoples.

Asia and Australia's engagement with Asia
Students could investigate a wide range of contexts that draw on Asia and Australia's engagement with Asia through Geography. This priority can be addressed through: the study of natural and ecological hazards and how the risks associated with such occurrences can be managed to eliminate or minimise harm to people and the environment; the challenges faced by megacities in developing countries, particularly those from the Asia region; human-related land cover transformations; and other transformations taking place as a result of economic and cultural integration.

Sustainability
Students can explicitly address Sustainability in Geography through an investigation of the approaches to sustainability and through an evaluation of alternative responses to geographical issues and phenomena. In doing so, they use economic, social and environmental criteria to frame investigative questions and to measure the capacity of something to be maintained indefinitely into the future.

Teacher resources:

City of Gold Coast website
Griffith Centre for coastal Management -> CoastEd -> Information Sheet Series

https://www.griffith.edu.au/engineering-information-technology/griffith-centre-coastal-management/community-projects/coasted/programs/resources/coasted-resources-and-information-sheet-series

City of Gold coast local studies library, Southport
http://www.goldcoast.qld.gov.au/library/local-studies-library-10111.html

FACTSHEET AND VIDEO LIST

COASTAL MANAGEMENT AND ENGINEERING FACTSHEET & VIDEO LIST

Griffith Centre for Coastal Management Fact Sheets

Beach Erosion: Coastal Processes on the Gold Coast
https://www.griffith.edu.au/__data/assets/pdf_file/0010/333685/Beach-erosion.pdf

Coastal Monitoring
https://www.griffith.edu.au/__data/assets/pdf_file/0009/322758/Coastal-Monitoring.pdf

Coastal Monitoring: Shoreline Position
https://www.griffith.edu.au/__data/assets/pdf_file/0008/322766/Coastal-Monitoring_Shoreline-Position.pdf

Coastal Observation Program- Engineering (COPE)
https://www.griffith.edu.au/__data/assets/pdf_file/0013/530041/Caring-for-our-coast-COPE.pdf

Currumbin Creek dredging
https://www.griffith.edu.au/__data/assets/pdf_file/0016/322801/Currumbin-Creek-Dredging.pdf

Currumbin Creek Coastal Processes
https://www.griffith.edu.au/__data/assets/pdf_file/0003/322851/Currumbin-Creek-Coastal-Processes.pdf

Cyclones
https://www.griffith.edu.au/__data/assets/pdf_file/0003/322869/cyclones.pdf

Delft Report: Key recommendations
https://www.griffith.edu.au/__data/assets/pdf_file/0003/322788/Delft-Report_Key-Recommendations.pdf

East Australian Current
https://www.griffith.edu.au/__data/assets/pdf_file/0005/322826/East-Australian-Current.pdf

Field investigation on Gold coast beaches
https://www.griffith.edu.au/__data/assets/pdf_file/0020/530075/Caring-for-our-coast-field-investigations.pdf

Gold Coast beach nourishment
http://www.goldcoast.qld.gov.au/documents/bf/fs-gc-beach-nourishment.pdf

Gold Coast Seaway
https://www.griffith.edu.au/__data/assets/pdf_file/0018/322803/Gold-Coast-Seaway.pdf

Gold Coast Seaway: A Marine Lovers Paradise
https://www.griffith.edu.au/__data/assets/pdf_file/0019/322831/Gold-Coast-Seaway-Marine-Life.pdf

History of coastal storms on the Gold Coast
http://www.goldcoast.qld.gov.au/documents/bf/fs-history-coastal-storms.pdf

Longshore drift: Coastal processes on the Gold Coast
https://www.griffith.edu.au/__data/assets/pdf_file/0009/322875/Longshore-drift.pdf

Looking after our dunes
https://www.griffith.edu.au/__data/assets/pdf_file/0005/322790/Looking-after-our-dunes.pdf

Narrowneck Artificial Reef: Construction
https://www.griffith.edu.au/__data/assets/pdf_file/0004/286825/Narrowneck.pdf

Northern Gold Coast Beach Protection Strategy: Improving Beach Width
https://www.griffith.edu.au/__data/assets/pdf_file/0004/322771/NGCBPS-Beach-Width.pdf

Sand Excavation
https://www.griffith.edu.au/__data/assets/pdf_file/0019/530029/Caring-for-our-coast_sand-excavation.pdf

Storm surges
https://www.griffith.edu.au/__data/assets/pdf_file/0003/322887/storm-surge.pdf

Tallebudgera Creek Dredging
https://www.griffith.edu.au/__data/assets/pdf_file/0020/322805/Tallebugdera-Creek-Dredging.pdf

Tidal exchanges on the Gold Coast
https://www.griffith.edu.au/__data/assets/pdf_file/0017/323243/Tidal-exchange.pdf

Training Walls
https://www.griffith.edu.au/__data/assets/pdf_file/0016/530044/Caring-for-our-coast_training-walls.pdf

Tsunamis
https://www.griffith.edu.au/__data/assets/pdf_file/0011/323210/tsunamis.pdf

City of Gold Coast References

Beach and water safety
http://www.goldcoast.qld.gov.au/thegoldcoast/beach-water-safety-3240.html

Broadwater Parklands: Coastal Management Initiatives
http://www.goldcoast.qld.gov.au/documents/bf/fs-Broadwater-Parklands-Coastal.pdf

Broadwater Parklands: Water Sensitive Urban Design (WSUD)
http://www.goldcoast.qld.gov.au/documents/bf/fs-Broadwater-Parklands-wsud.pdf

Coastal Videos and resources
http://www.goldcoast.qld.gov.au/thegoldcoast/coastal-videos-resources-23364.html

Disaster Management
http://www.goldcoast.qld.gov.au/council/disaster-management-120.html

Ecological response to storms
http://www.goldcoast.qld.gov.au/documents/bf/fs-Ecological-Response-to-Storms.pdf

Gold Coast Shoreline Management Plan
http://www.goldcoast.qld.gov.au/documents/bf/palm-beach-gcsmp-exec-summary.pdf

Gold Coast Ocean Beaches Strategy 2013-2023
http://www.goldcoast.qld.gov.au/documents/bf/ocean-beaches-strategy-2013-2023.pdf

Interactive guide to the formation of Gold Coast beaches
http://www.goldcoast.qld.gov.au/thegoldcoast/gold-coast-beaches-154.html

Management of Coastal Dune Areas
http://www.goldcoast.qld.gov.au/gcplanningscheme_0305/support_files/scheme/12_policy_15.pdf

Oceanway network
http://www.goldcoast.qld.gov.au/council/gold-coast-oceanway-tugun-to-bilinga-6445.html

Palm Beach Shoreline Project
http://www.goldcoast.qld.gov.au/thegoldcoast/palm-beach-shoreline-project-10919.html

Seawall Construction Project
http://www.goldcoast.qld.gov.au/seawall-construction-projects-20762.html

Surf Management Plan
http://www.goldcoast.qld.gov.au/thegoldcoast/surf-management-plan-23579.html

The Delft Report
http://www.goldcoast.qld.gov.au/the-delft-report-4551.html

Wave Break Island
http://www.goldcoast.qld.gov.au/documents/bf/fs-wave-break-island.pdf

Who manages our coast?
https://www.griffith.edu.au/__data/assets/pdf_file/0006/471093/Who-manages-our-coast_ver2.pdf

Videos

Griffith Centre for Coastal Management Youtube channel:
https://www.youtube.com/channel/UCnm1Jyh6clfEZilhvNzJxzg

Dune Management; it's worthwhile (13.5min)
https://www.youtube.com/watch?v=ujKk8KeyFh8

Last Line of defence – Seawalls (5min)
https://www.youtube.com/watch?v=8RVpKVDxRnE

Shaping our Coast – Dredging and nourishment (4min)
https://www.youtube.com/watch?v=-1yM6uXGHvM

Our Shore Future – hydrographic beach surveying (4.5min)
https://www.youtube.com/watch?v=XCFv_8YexW8

Narrowneck reef (4min)
https://www.youtube.com/watch?v=oUfLGStUKPs

Coastal Management Centre Youtube channel:
https://www.youtube.com/playlist?feature=edit_ok&list=PLs53dPt8u9lal_YDRljZlmCGLdgMAA0R6

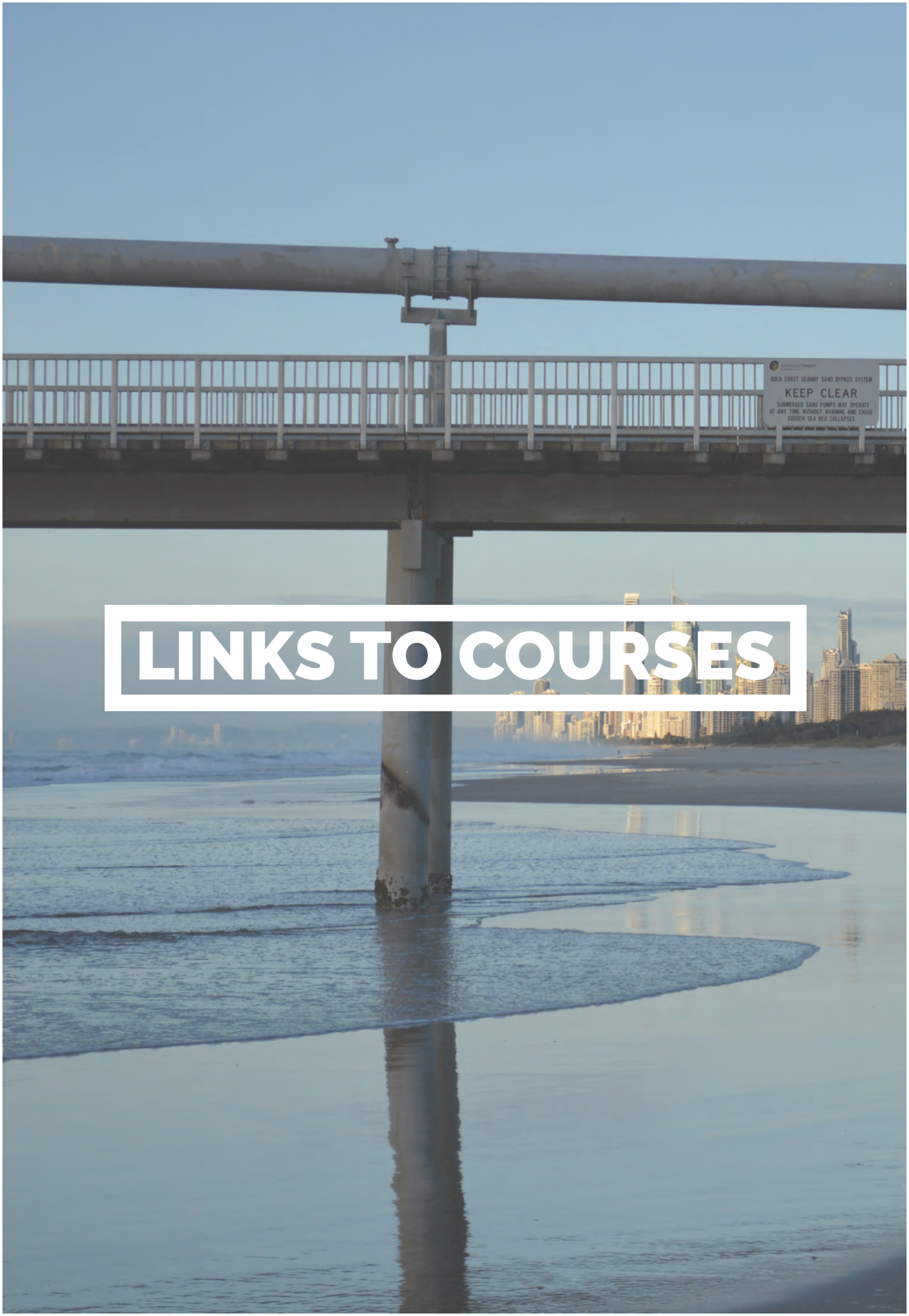
History of Gold Coast Beaches (17.5min)
https://www.youtube.com/watch?v=DaR9vMCTl4k&list=PLs53dPt8u9lal_YDRljZlmCGLdgMAA0R6&index=5

City of Gold Coast video resources:
http://www.goldcoast.qld.gov.au/thegoldcoast/coastal-videos-resources-23364.html

Our coast – celebrating 50 years of coastal management.
https://www.youtube.com/watch?v=ZFtJJ7Uf24c

Palm Beach Shoreline project
http://www.goldcoast.qld.gov.au/thegoldcoast/the-challenge-10961.html

Seawall construction project (6.3min)
http://www.goldcoast.qld.gov.au/seawall-construction-projects-20762.html



LINKS TO COURSES

COASTAL ENGINEERING LINKS TO COURSES AT GRIFFITH UNIVERSITY

Griffith University offers a range of courses related to the topic coastal engineering and coastal management. These courses are:

Bachelor of Science (Gold Coast and Nathan campus)

Majors:

Applied Mathematics
Biochemistry and Molecular Biology,
Chemistry,
Clinical Sciences,
Geography,
Marine Biology,
Microbiology,
Physics,
Wildlife Biology

Career options:

Depending on the major, you will be prepared for work in environment-related jobs, for example as an environment consultant, environmental scientist or mine environment officer; in biological, chemical and clinical sciences as a microbiologist, pharmaceutical scientist, biochemist, chemist or biotechnologist; in physics and maths as a mathematician or physicist; or, with further study, in a broader role, for example as a patents officer or science teacher.

Bachelor of Urban and Environmental Planning (Gold coast and Nathan campus)

Career options:

You will find opportunities with community and industry groups, local councils and other government bodies and consultants. You may also find work in development companies implementing proposals for new housing estates, tourism complexes, transport networks, shopping centres and other commercial projects. Large development companies increasingly employ their own planners.

Bachelor of Engineering with Honours/Bachelor of Environmental Science (Gold Coast and Nathan campus)

Career options:

You will find employment in government departments, environmental agencies, civil construction projects, consultancies, waste management, mining, oil, smelting and manufacturing industries.

Bachelor of Engineering with Honours/Bachelor of Science (Gold Coast and Nathan campus)

Majors:

Engineering majors:

Civil Engineering
Electrical Engineering
Electronic Engineering
Environmental Engineering
Mechanical Engineering

Science Majors:

Applied Mathematics,
Physics

Career options:

You will find employment in government departments, construction companies, telecommunications, mining, oil, smelting and manufacturing industries, research organisations.

For more information visit: https://www.griffith.edu.au/

Griffith UNIVERSITY
Centre for Coastal Management

COASTED

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TEACHER PACK:

COASTAL ENGINEERING AND MANAGEMENT

LESSON PLANS, ACTIVITIES AND RESOURCES FOR PREP TO YEAR 12