

Stage 4 – Water in the World Teacher lesson plan – Alexandra Canal at Tempe Reserve self-guide excursion		Sydney WATER
The value of water - investigate the economic, cultural, spiritual and aesthetic values of water for people, including Aboriginal and Torres Strait Islander Peoples and/or peoples of the Asia region, for example: - description of the ways water is used by people eg agricultural, commercial, industrial and recreational uses - discussion of variations in people's perceptions about the value of water eg economic versus aesthetic		Class group: Time: Suggestion 3-4 x 60min class lessons - fieldwork 2-3 hours
Outcomes - explains how interactions and connections between people, places and environments result in change GE4-3 - discusses management of places and environments for their sustainability GE4-5 - acquires and processes geographical information by selecting and using geographical tools for inquiry GE4-7 - communicates geographical information using a variety of strategies GE4-8	Geographical concepts - Place: the significance of places and what they are like - Environment: the significance of the environment in human life, and the important interrelationships between humans and the environment - Interconnection: no object of geographical study can be viewed in isolation - Sustainability: the capacity of the environment to continue to support our lives and the lives of other living creatures into the future - Change: explaining geographical phenomena by investigating how they have developed over time	
Geographical enquiry skills Acquiring geographical information - collect, select and record relevant geographical data and information, using ethical protocols, from appropriate primary data and secondary information sources Processing geographical information - evaluate information sources for their reliability and usefulness - represent data in a range of appropriate forms, with and without the use of digital and spatial technologies - apply geographical concepts to draw conclusions based on the analysis of the data and information collected Communicating geographical information - present findings, arguments and ideas in a range of communication forms selected to suit a particular audience and purpose; using geographical terminology and digital technologies as appropriate - reflect on their learning to propose individual and collective action in response to a contemporary geographical challenge, taking account of environmental, economic and social considerations, and predict the expected outcomes of their proposal	Geographical tools Maps – M - maps to identify direction, scale and distance Fieldwork – F - observing, measuring, collecting and recording data, developing and conducting surveys and interviews Spatial technologies – ST - satellite images, global positioning systems (GPS), geographic information systems (GIS) Visual representations – VR - photos, aerial photos, illustrations, annotated diagrams, multimedia, field sketches, web tools	

Teaching and learning	Resources
Lesson 1 - Introduction Q. What do we think about when I say “Sydney’s waterways”? are they natural or have they been changed by humans? Are they just the harbour and beaches? A . It’s also the rivers, creeks, wetlands and even stormwater drains. Do - Let’s find some – open google maps over Sydney, and look for the blue! 1. Find the Parramatta River - Look for its tributaries - Duck Creek, Haslams Creek, Powells Creek, Whites Creek, Johnsons Creek 2. Find the airport - Find Cooks River to the west of the Airport - From the Cooks River find Tempe Reserve and Alexandra Canal Q. Why do some of these creeks have straight sections? Look at google earth and zoom in. What do you see? (walls, wharves, bridges, roads, paths) A. Over time, as Sydney has grown, our uses for waterways has changed. Natural creeks were turned into canals for transport of goods and people. Some creeks were redirected around the places we wanted to build houses and industry. Some creeks have become hidden underground. All of them have become stormwater drains. A stormwater drain collects the water that falls on roads and pathways. Do – take a look at the catchment (all the water runs to a common point) on our stormwater catchment map to see where water flows from, into Alexandra Canal. Advanced – estimate the area of this catchment Q. So who is responsible for looking after these waterways? A. Sydney Water and a range of other agencies are responsible for managing the urban water cycle in Sydney, the Blue Mountains and the Illawarra.	Online links Education summary of stormwater http://www.sydneywater.com.au/SW/education/Watermanagement/Stormwater/index.htm Stormwater networks http://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/stormwater-network/index.htm current stormwater project summary http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/current-projects/managing-stormwater/index.htm Stormwater catchment map http://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/stormwater-catchment-map/index.htm Area measurement instructions for google maps https://support.google.com/mymaps/answer/3502610?co=GENIE.Platform%3DDesktop&hl=en Urban water management http://www.sydneywater.com.au/SW/education/Watermanagement/Urbanwatermanagement/index.htm

Lesson 2 – Secondary research Sydney Water manages a variety of projects that aim to improve the liveability of our city. Urban waterways play an important role in the cityscape. They can be modes of transport, help to reduce the impact of flooding, increase the value of property, be a source of recreation and simply make a park or open space a nice place to spend time. Alexandra Canal is an example of a waterway that is managed by Sydney Water. Using the PowerPoint presentation “Sydney Water and Alexandra Canal”, you may like to have the students either: • Make a timeline of human interactions with Alexandra Canal waterway. • Work in groups to investigate the information provided and report back to the class. The presentation includes information about the value the waterway has had over time. There are sample student questions, web links and additional information in notes section of the PPT presentation.	Education resources PowerPoint presentations • Sydney Water and Alexandra Canal Worksheets • Class worksheet - Alexandra Canal timeline Online links – many more links are available in PPT notes Alexandra Canal heritage information http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/Heritage-search/heritage-detail/index.htm?heritageid=4571712
Lesson 3 – Fieldwork This is a program you can deliver yourself at a public site linked to a Sydney Water project. Please see the Alexandra canal Tempe Reserve Field Worksheet teachers answers document for instructions. Students will investigate the aesthetic, recreational and any other observable value of Alexandra Canal near Tempe Reserve. There are a number of field techniques used. - Aerial photograph annotation - plot where to investigate and hypothesise investigation outcomes. - Site evaluation for the landscape and waterway – looking at uses of the space by people, and animals, vegetation, litter, environmental quality (observation) and identify human modifications - Field sketch – identifying a water based view with potential appealing aesthetic value (Note – most of the text books currently published offer in text or online field sketch instructions). - Annotated photographs – identifying evidence of the different values placed on this waterway over time. - Sensory mapping – using various senses to map the sounds and feeling in the area (use an online guide before going into the field. It is a good practice to go into the playground to try this first).	Education resources Worksheets • Alexandra Canal Tempe Reserve Field Worksheet students • Alexandra Canal Tempe Reserve Field Worksheet teachers answers Online links Plant and animal ID https://www.ala.org.au/faq/species-identification/ Sensory mapping http://sensorymaps.com/ https://makingmaps.net/tag/sensory-mapping/ Field Sketch https://www.geogspace.edu.au/verve/resources/2.1.2.3_1_field_sketching.pdf

Lesson 4 – Reporting Discussion points • Values of waterways change according to its uses. How has the value of Alexandra Canal changed over time? • Brainstorm answers from the class. Have the students put the changing values in order of the impact on Alexandra Canal. • Class discussion and sharing - Why do those values change? What do you think is the value of this waterway today? • Evaluation – how have our changing values for this waterway shown a changing attitude to sustainability? Final product options • Create a field report • Create an investigative news report • Develop a mapping app to take people on a guided walk of the waterway • Create an illustrated timeline of the waterways changes over time	Education resources Note - Available on Sydney Water website by Term 2 2018. For now, refer to your syllabus support documents or textbook online support.
Extension Lesson 5 – Future planning Use your field report findings to design the next stage in the rehabilitation and naturalisation of Alexandra Canal - What's your plan? How should this waterway look to you? Use the “Future plans for Alexandra Canal” worksheet and use photographs of the site to help you create a design for the future. - How might we use this waterway in the future? How could we manage it better? - What animals would you like to see here? - Could we use it in a totally different way than anything before? - How can we recognise the past here too? Present your design – depending on your resources, this may be a drawn example, or you could generate in GIS to show layering of changes over time..... Be creative... Use any format! Share your design with Sydney Water and have a real stormwater expert evaluate your design	Education resources Worksheets • Class worksheet - Future plans for Alexandra Canal Engage with us Email education@sydneywater.com.au Facebook Sydney Water Twitter @sydneywaternews Instagram @sydneywater Hashtag #sydneywatereducation