reef guardians

Wetlands

Year 7 Australian Science Curriculum Focus

Explaining phenomena involving science and its applications

Students investigate the properties of a range of wetlands including current environmental concerns affecting those wetlands.

Students develop an understanding of:

- Different wetlands and their individual properties
- Food chains and food webs within different wetlands
- Water cycles within different wetlands
- Environmental impacts on wetlands e.g. flood, drought
- The value of wetlands within the Australian environment
- Human impacts on wetlands, including water management, industrial, rural and urban development
- Future considerations to care for wetlands.

Inquiry questions for the unit:

- What are wetlands and how are they classified?
- What organisms live in wetlands and how are they classified?
- What recommendations could be made to care for and improve the quality of wetlands in Australia?
- What are food chains and food webs and how are they used to describe interactions between organisms in wetlands?
- Why are wetlands such an important part of the Australian environment?
- How does nature impact the water cycle in different wetlands?
- How do humans impact the water cycle in different wetlands?
- What is the importance of water cycles in wetlands?

Australian Government
Great Barrier Reef Marine Park Authority

Year 7 Science: Wetlands

School name	Unit title	Duration of unit
	Wetlands	Approximately eight weeks

Unit outline
Year 7 Australian Science Curriculum Focus – Explaining phenomena involving science and its applications. Students investigate the properties of a range of wetlands including current environmental concerns affecting those wetlands. Students develop an understanding of: • Different wetlands and their individual properties • Food chains and food webs within different wetlands • Water cycles within different wetlands • Environmental impacts on wetlands e.g. flood, drought • The value of wetlands within the Australian environment • Human impacts on wetlands, including water management, industrial, rural and urban development • Future considerations to care for wetlands. Inquiry questions for the unit: • What are wetlands and how are they classified? • What organisms live in wetlands and how are they classified? • What are food chains and food webs and how are they used to describe interactions between organisms in wetlands? • What is the importance of water cycles in wetlands? • Why are wetlands such an important part of the Australian environment? • How does nature impact the water cycle in different wetlands? • How do humans impact the water cycle in different wetlands? • What recommendations could be made to care for and improve the quality of wetlands in Australia?

Year 7 Level Description – Over Years 7 to 10, students develop their understanding of microscopic and atomic structures; how systems at a range of scales are shaped by flows of energy and matter and interactions due to forces and develop the ability to quantify changes and relative amounts. In Year 7, students explore the diversity of life on Earth and continue to develop their understanding of the role of classification in ordering and organising information. They use and develop models such as food chains, food webs and the water cycle to represent and analyse the flow of energy and matter through ecosystems and explore the impact of changing components within these systems. They consider the interaction between multiple forces when explaining changes in an object's motion. They explore the notion of renewable and non-renewable resources and consider how this classification depends on the timescale considered. They investigate relationships in the Earth, sun, moon system and use models to predict and explain events. Students make accurate measurements and control variables to analyse relationships between system components and explore and explain these relationships through increasingly complex representations.

Year 7 Achievement Standard - By the end of Year 7, students pose questions and apply scientific concepts to everyday problems and make general predictions based on their experiences. They plan procedures for investigations that take into account the need for fair testing and use equipment that improves fairness and accuracy. They communicate their observations and data clearly, summarise their data where appropriate and suggest improvements to their methods.

Students predict the effect of single changes on systems involving living things and suggest ways to classify organisms based on observable differences. They distinguish between pure substances and mixtures and plan appropriate methods to separate mixtures. They explain why some resources are not renewable and describe changes to water during the water cycle. They describe how unbalanced forces change the motion of objects and how changes in the position of objects in space cause other observable effects. They identify where science knowledge is used to propose solutions to problems and describe examples of where people use science in their work. They describe how evidence has led to an improved understanding of a scientific idea.

Teacher Notes:

- **Unit overview**

The Great Barrier Reef Marine Park Authority (GBRMPA) Wetlands Teaching Unit is a science-based Year 7 unit of work. The content descriptors for this unit are from the 2011 Australian Science Curriculum (www.australiancurriculum.edu.au). Following the inquiry based 5Es approach to teaching science, the unit is based on the Australian Curriculum Assessment and Reporting Authority (ACARA) expectations of a minimum of two hours per week of science lessons for Year 7 students. Each lesson is of approximately one hour duration, with some lessons requiring more time to allow further depth of study or time for excursions. The nature of science investigations is to follow the line of student inquiry to promote and encourage students to think like scientists. Teachers may find that students will need, or want, to complete investigations other than those suggested in the teaching strategies outlined in this unit. Students are to be encouraged to follow their own line of inquiry and in the case where students do this, the teaching strategies and resources outlined in this unit may be used as a guide to supplement the student directed investigations. The overall unit, or the individual lessons, could be extended or shortened to cater for individual classes as deemed necessary by the class teacher. Teachers will need to allow time to prepare for the lessons prior to teaching each lesson.

- **Aim of the unit**

The lessons are structured to build students knowledge of wetlands to reach the final goal of being able to classify and diagnose wetlands according to their attributes, and propose ways of creating a more sustainable environment using their knowledge of wetlands. Wetlands play a vital role in water quality throughout ecosystems which have direct and indirect impacts on the Great Barrier Reef (for more information on wetlands and the Great Barrier Reef see below in 'Wetland information' and also www.gbrmpa.gov.au). Teaching students about wetlands will build their environmental knowledge and encourage their understanding of sustainability and stewardship. The main premise of this unit is water quality, which is one of the Key Focus Areas of the *GBR Outlook Report 2009* (see www.gbrmpa.gov.au for more information on the *GBR Outlook Report 2009*). GBRMPA encourages teachers to follow the main aim of Reef Guardianship – to be stewards of the environment.

- **Wetland background information**
  - **What is a wetland?**
    Wetlands are areas either temporarily or permanently covered by water and can be either natural or artificial with water that is still or flowing, fresh, brackish (slightly salty) or salty. This includes marine water which is no more than six metres deep at low tide. Wetlands often include riparian zones (land which adjoins or directly influences a body of water) and coastal zones adjacent to the wetlands, as well as islands.
  - **Types of wetlands**
    Wetlands can be categorised into two main types:
    - Saltwater wetlands are coral reefs, seagrass meadows, salt marshes, mudflats, mangrove areas and estuaries
    - Freshwater wetlands can be flowing or still such as swamps, billabongs, creeks, lakes or rivers. Freshwater wetlands can be further broken down into their local area impacts, for example farm and urban wetlands.
  - **Role of wetlands – improving water quality**
    Wetland ecosystems provide many benefits and services to society, the environment, plants, animals and the Great Barrier Reef. Wetlands are often described as "the kidneys of the landscape" because of their ability to filter and remove some pollutants from runoff waters and improve their water quality. When water flows through a catchment, it carries nutrients and sediments with it, which have originated from a range of land-based sources such as soil erosion, fertilisers and animal waste on farms or detergents from households. When water enters a wetland, it slows down and spreads out into a larger area. The slow moving water currents in a wetland allow the nutrients and sediments in suspension to settle out, which along with the dense vegetation in the wetland, helps to filter out many of the nutrients, sediments and other pollutants before they flow out of the wetland and potentially enter the Reef. This means that the water flowing out of a wetland will generally be cleaner than the water coming in.
  - **The importance of wetlands**
    Wetlands are ecologically, economically and socially important as they:
    - Buffer the effects of pollutants by filtering and removing some nutrients, sediments and chemical contaminants from run-off that would otherwise go into creeks and rivers and eventually the Reef
    - Absorb and slowly release floodwaters, therefore contributing to protecting surrounding areas against floods
    - Protect shores from coastal erosion, storm surges and flooding by creating a buffer
    - Provide breeding sites and habitat for both freshwater and marine fish species and crustaceans
    - Provide breeding and roosting sites for migratory birds and local water birds
    - Provide habitat for a variety of other animals and plants
    - Feature significantly in the cultural heritage, spiritual values and day-to-day living of Aboriginal and Torres Strait Islander peoples
    - Provide a source of water
    - Offer a variety of recreational activities
    - Are used for educational purposes and scientific research
    - Feature strongly in Queensland's tourism and recreational appeal.

Unit Lessons Overview

Engage	Lesson 1: What do we know and want to know about wetlands?
Explore	Lesson 2: What is a wetland? What do they do? Lesson 3: OPTIONAL – Water Flow Through Wetlands (review of the water cycle).
Explain	Lesson 4: Wetland Diversity Lesson 5: Who lives in the wetlands? Lesson 6: OPTIONAL – Food Chains Lesson 7: Food Webs
Elaborate	Lesson 8: How it all links together Lesson 9: Health of wetlands – virtual field trip Lesson 10: Excursion to a wetland
Evaluate	Lesson 11: Presentation Preparation Lesson 12: Presentation Preparation Lesson 13: Presentation Preparation Lesson 14: Present Presentations

Identify curriculum			
Content descriptions to be taught			**General capabilities and cross-curriculum priorities**
Science Understandings	**Science as a Human Endeavour**	**Science Inquiry Skills**	
Biological Sciences • There are differences within and between groups of organisms; classification helps organise this diversity • Interactions between organisms can be described in terms of food chains and food webs; human activity can affect these interactions **Earth and Space Sciences** • Water is an important resource that cycles through the environment	**Nature and the Development of Science** • Science knowledge can develop through collaboration and connecting ideas across the disciplines **Use and Influence of Science** • Science and technology contribute to finding solutions to a range of contemporary issues, these solutions may impact on other areas of society and involve ethical considerations • Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management • People use understanding and skills from across the disciplines of science in their occupations	**Questioning and Predicting** • Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge **Planning and Conducting** • Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed • In fair tests, measure and control variables and select equipment to collect data with accuracy appropriate to the task **Processing and Analysing Data and Information** • Construct and use a range of representations including graphs, keys and models, to represent and analyse patterns or relationships, including using digital technologies as appropriate • Summarise data, from students' own investigations and secondary sources and use scientific understanding to identify relationships and draw conclusions	**Literacy** • Engage with a range of print, visual, multi modal and scientific texts, their features and their language • Use the skills of researching, planning, writing and presenting **ICT competence** • Explore and research a range of topics • Interact in virtual, online experiments **Critical and Creative Thinking** • Research, investigate, analyse, propose and justify issues and ideas • Prepare and present those issues and ideas to a set audience **Ethical Behaviour** • Propose ideas and solutions to issues that are affecting the wider community **Personal and Social Competence** • Participate in class discussions • Listen and respond to others' work • Work collaboratively with others • Show manners and respect during others' presentation

Identify curriculum			
		Evaluating • Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected and identify improvements to the method • Use scientific knowledge and finding from investigations to evaluate claims **Communicating** • Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate	**Sustainability** • Engage in assessing and analysing the needs of living things • Identify problems within an ecosystem and propose solutions to future management • Make connections that humans, animals and plants are all dependent on healthy ecosystems

Relevant prior curriculum	Curriculum working towards
By the end of Year 6, students plan investigations to answer questions relating to simple cause-and-effect relationships. When carrying out investigations, they collect relevant data and apply the concept of a fair test. They reflect on the processes that they have used and demonstrate an awareness of science inquiry methods in their work. They represent data and knowledge using introductory scientific language and graphical representations. Students suggest explanations for observable changes and they predict the effect of environmental changes on living things. They compare different types of change in materials. They identify requirements for the transfer of electricity and describe one way that electricity can be generated. They describe how developments in science have affected peoples' lives and identify examples where scientific knowledge is used in decision making.	In Year 8, students are introduced to cells as microscopic structures that explain macroscopic properties of living systems. They link form and function at a cellular level and explore the organisation of body systems in terms of flows of matter between interdependent organs. Similarly, they explore changes in matter at a particle level and distinguish between chemical and physical change. They begin to classify different forms of energy and describe the role of energy in causing change in systems, including the role of heat and kinetic energy in the rock cycle. Students use experimentation to isolate relationships between components in systems and explain these relationships through increasingly complex representations. They make predictions and propose explanations, drawing on evidence to support their views.

Links to other learning areas

QSA Year 7 Literacy Indicators (2009)

Speaking and Listening

- SL7 vii. Plan and organise spoken presentations for a specific purpose, applying the structures and features that best suit the context.

Writing and Designing

- WD7 x. Select technical or literary language that accurately identifies important concepts or features and clarifies relationships that exist between them, and maintains these relationships with context-specific vocabulary and related words.

Assessment		Make judgments
Describe the assessment	**Assessment date**	Student task sheet, links to QSA literacy indicators (2009) and guide to making judgements can be found in resource section of the unit.
Summative Assessment Students will provide an oral presentation on two Australian wetlands of their choice – one healthy and functioning and one degraded and unhealthy. Students will include: • Annotated poster of both wetlands including the water cycle and food webs within that environment • Explanations of why one wetland is pristine and the other is under threat including data/information collected to show the factors and processes involved in damaging the under threat wetland • Proposals for solutions to improve the ecosystem health of the under threat wetland using specific scientific knowledge • Proposals for solutions for maintaining the condition and health of the healthy functioning wetland.	The summative assessment piece is designed to be produced and presented during the Evaluate stage of the unit when students will have gathered all the knowledge required to successfully address the criteria. This date is to be determined by the class teacher.	

Useful Websites

ABC Science – Catchment Detox Game
www.catchmentdetox.net.au/

Department of Sustainability, Environment, Water, Population and Communities
http://www.environment.gov.au

Eco Kids
www.ecokids.ca

Great Barrier Reef Marine Park Authority
www.gbrmpa.gov.au

Queensland Wetlands Program
www.wetlandinfo.derm.qld.gov.au

Healthy Waterways
www.healthywaterways.org

Learning Place Virtual Field Trips
www.learningplace.com.au/cop/vft/

Middle School Science Resources
www.middleschoolscience.com

The Biology Corner
www.biologycorner.com

Water Watch (A creek clean up game and good poster resources showing healthy and unhealthy catchments)
www.qld.waterwatch.org.au/schools/waterwatchgame.html

Water Watch (A Waterways Health Check worksheet)
www.waterwatch.org.au

Wetland Care Australia (good images of wetlands)
www.wetlandcare.com.au

Wetland Link International
www.wlistevisit.org

Useful Books

Discover and Learn About Australian Wetlands and Waterways, Slater, Pat (Ark Australia Habitats and Ecosystems, Steve Parish, 2002.)

Wetland Rehabilitation Guidelines for the Great Barrier Reef Catchment, WetlandCare Australia (http://www.wetlandcare.com.au/index.php/info-and-links/restore-your-wetland/wetland-rehabilitation-guidelines-for-queensland-s-gbr-catchment/).

East Point Mangrove Boardwalk: An Educational Resource Kit for Primary and Junior Secondary Teachers, Greening Australia NT Inc. (http://www.greeningaustralia.org.au/uploads//General%20pdfs/NT_East_Point_Mangrove_Boardwalk.pdf).

Water: Learn it for Life! Department of Environment and Resource Management (http://www.derm.qld.gov.au/waterwise/education/index.html).

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
ENGAGE – To capture interest and discover what we think we know **Lesson 1-** What do we know about wetlands? **Suggested time** – 1 hour **Introduction** – What do we know about wetlands? • Discuss with students what they already know about wetlands and what they could find out about wetlands. Use a TWLH (or KWL) chart to record student responses. Some of the following questions could be a guide to start discussions: ○ What is a wetland? ○ Are there any wetlands in our local area? If so, where are they, what do they look like? ○ What are some examples of wetlands around Australia? Where are they? What do they look like? ○ Are animals and plants found in wetlands? If so, what kind of animals and plants?	**Lesson 1** Diagnostic assessment opportunities: - observations of students' responses during discussion. - observations of student participation during construction of concept map. - students could produce their own TWLH chart in their science journal for a concrete record of their prior knowledge.	Section 6 of the *Disability Standards for Education* (The Standards for Curriculum Development, Accreditation and Delivery) state that education providers, including class teachers, must take reasonable steps to ensure a course/program is designed to allow any student to participate and experience success in learning. The *Disability Standards for Education 2005* (Cwlth) is available from: <www.ag.gov.au> select Human rights and anti-discrimination > Disability standards for education. **ESL Considerations** Teachers should refer to the Learning Place www.learningplace.com.au 'ESL in the Classroom' for 'Break it Down, Build it Up' resources to help restructure the unit according to the ESL needs of the class.	**Lesson 1** Suggested websites for images of wetlands: GBRMPA www.gbrmpa.gov.au Wetland Care Website www.wetlandcare.com.au Learning Place Virtual Field Trips www.learningplace.com.au/cop/vft/ Wetland Link International www.wlistevisit.org Australian Wetland Images http://www.environment.gov.au/cgi-bin/wetlands/alphablist.pl Queensland Wetlands Program www.wetlandinfo.derm.qld.gov.au

T	W	L	H
What we **think** we know about wetlands	What we **want** to learn about wetlands	What we **learned** about wetlands	**How** we know (scientific understandings)

Investigation – What do we want to know about wetlands?

- View images of wetlands. Discuss with students what they can see in the images. Encourage students to ask questions about what they see. Record these questions in the TWLH chart. These questions could be organised into specific areas of wetlands – plants, animals, water, people. Ensure to refer back to and answer these questions as students progress through the unit.
- Start a word wall to identify specific wetland vocabulary.
- OPTIONAL extra activity - Create a concept map using known information. Give students specific words from their current knowledge to begin the concept

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
map. Use phrases to link the words together in the concept map. • Start a science journal for students to record their learning and reflection as they progress through the unit. The science journal could be done in a simple ruled exercise book or a scrap book, or done on a computer in a format suitable to the class. How much time students are given to write in their science journal each lesson will need to be determined by the teacher according to the needs of the students. A science journal is a record of observations, experiences and reflections. It contains a series of dated, chronological entries. It may include written text, drawings, labelled diagrams, photographs, tables and graphs.		**Risk Management** Refer to Department of Education and Training www.education.qld.gov.au for advice and forms relating to risk management during curriculum activities and excursions.	
EXPLORE – To have shared, hands-on experiences **Lesson 2 –** What is a wetland? What do they do? **Suggested Time** – 1 hour **Introduction** – What is a wetland? • Read the Wetlands Reef Beat 2006 poster 1, 'What is a wetland?' together. In pairs have students focus on the first two paragraphs – 'What is a wetland?' and 'Types of wetlands' – to identify specific wetlands in their local area. Have pairs share their ideas with the class, identifying what information in the paragraphs informs them that their chosen area is a wetland. This information could be kept for the optional extra activity in Lesson 4. • Display the Reef Beat poster and begin an information tree diagram showing types of wetlands. This could be done on cards to rearrange and add paragraphs of information about each wetland area to the chart as students gain more complex knowledge about wetlands. At this stage it could be as simple as just naming the wetlands. Continue to add to the tree diagram throughout the unit. Students will be able to utilise this knowledge for their final assessment piece. (See Resource 1 for example to begin the chart.) **Investigation** – What do wetlands do? • Read the 'Role of wetlands' paragraph on poster 1 (Reef Beat 2006), add difficult words to the word wall and discuss what students think this means for their identified local wetlands. • Complete the Sponge/Filter investigation to demonstrate how a wetland soaks up water and can filter the water. (See Resource 2 for procedural text outlining this investigation.) Explain to students that the items used to filter the sediment in the	**Lesson 2** Formative assessment opportunities: - observations of student responses during introduction activity. - investigation planner can be used as a record of students' science inquiry skills (see content descriptors).		**Lesson 2** GBRMPA Reef Beat- Poster 1 - 2006 – What is a Wetland? www.gbrmpa.gov.au Wetland definitions at http://wetlandinfo.derm.qld.gov.au/wetlands/WetlandDefinitionstart.html More wetland definitions: http://www.environment.gov.au/water/publications/environmental/wetlands/classroom-kit.html. Other wetland information posters available at: www.wetlandcare.com.au Queensland's wonderful wetlands poster/brochure at http://wetlandinfo.derm.qld.gov.au/wetlands/factsfigures/qldwetlands.html

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
water are acting as the wetland. • Once the investigation has finished, extend students by sharing their results and discussing/brainstorming what the importance is behind wetlands filtering the water. Students could record their thoughts in their science journal. • Students add their learning and reflections to their science journal. **Lesson 3** – Water flow through wetlands (review of water cycle) **OPTIONAL LESSON** – If students have enough experience with the water cycle to be able to continue through the unit without this review lesson, teachers may choose to skip this lesson and move onto Lesson 4. **Suggested Time** – 1 hour **Introduction** – Review of water cycle • Using the Water Cycle Poster (or the Total Water Cycle Poster depending on students' prior knowledge of the water cycle) from the Department of Environment and Resource Management Waterwise Program, review with students the water cycle. Put key words of the water cycle onto the word wall. Ask students to use their knowledge from the Reef Beat poster in Lesson 2 to identify where the wetlands are on the Water Cycle Poster. Identify the wetlands as freshwater or saltwater wetlands. **Investigation** – Water flow through wetlands • Create a miniature catchment model to demonstrate how water flows through wetlands and can be affected by flood and drought (natural events) as well as pollution (human influenced event). Use coloured dye to represent the pollution to see how far it spreads. Ideas to build the catchment model could be: ○ Building a simple wetland in a tray using play dough or clay to create a water path with sponges and material to act as wetlands. Use twigs or plastic lego toys to represent animals and plants. ○ Use a sandpit and sandpit toys to create a larger scale model. ○ Drawing a model may also help students to cement their understanding of the water cycle. • Take photos of catchment models as they are being built and during the floods, drought and pollution events. These could be used for extra activities (see assessment ideas for Lesson 3), or to make a book (see ESL considerations) about the water cycle as an extra literacy activity. • Discuss and make conclusions about what happens when there is too much water, or when there is not enough to flow through the catchment. Who or what is affected	**Lesson 3** Formative assessment opportunities: - observations of student responses during discussions . - photographic record of catchment models built, student could print these photos and add descriptions and reasoning behind their decisions about how they built the model (this could be done as an extra activity or as a homework activity). - student reflections in their science journal.		Resource 1 – Example of a tree diagram. Resource 2 – What do wetlands do? Procedural Text. Resource 3 – Investigation Planner. **Lesson 3** Waterwise Resources and water cycle poster www.derm.qld.gov.au/waterwise/ Healthy Waterways Flood resources http://www.healthywaterways.org/HealthyWaterways/FloodInfo/FloodResources.aspx

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
by too much water and the lack of water? • Discuss and make conclusion about how far the dye travels when it is introduced into the water cycle. Who or what is affected by the pollution? Do the wetlands catch and filter some of the pollution? • Use knowledge from Lesson 2 to discuss and draw conclusions about the importance of wetlands on filtering water as it enters the ocean. • Students add their learning and reflections to their science journal.			
EXPLAIN – To demonstrate what we have learned by exploring **Lesson 4** – Wetland Diversity **Suggested time** – 1 – 2 hours **Introduction** – Wetland Diversity • As a class read Reef Beat 'Wetland diversity' poster. Add new words to the word wall and discuss what some of the similarities and differences are between the wetlands. **Investigation** – Mini Information Reports • Individually or in pairs, have students create mini information reports on a specific classification of a wetland. Have information posters (Reef Beat 2006 'Wetland diversity', WetlandCare Australia www.wetlandcare.com), books and Internet research available for students to access. Key focus questions and an information report structure may also help students to write their mini information report. • Students present their information report to the class and display/add to the wetlands tree diagram and also the word wall. The reports could also be in the form of a PowerPoint presentation to make an information book on wetlands that could be used in other classes or placed in the library. • **OPTIONAL extra activity** – use the information collected in Lesson 2 about local wetlands. As a class, add to this list using new knowledge of wetlands. In groups or individually, have students classify the wetlands and compare/discuss their decisions about how they classified the different wetlands and what made them choose those classifications. • Students add their learning and reflections to their science journal.	**Lesson 4** Formative assessment opportunities: - information reports could be used to assess extent of research skills, writing skills and contextual knowledge.		**Lesson 4** GBRMPA Reef Beat 2006 Poster 2 – Wetland Diversity www.gbrmpa.gov.au Other wetland information posters available at: www.wetlandcare.com.au Books from the library on wetlands. Computers for Internet research.

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
Lesson 5 – Who lives in the wetlands? **Suggested time** – 1 hour **Introduction** – Classify Wetlands • Have a range of posters/pictures available of different wetlands. These could be from the GBRMPA, WetlandCare Australia, Healthy Waterways, or in books from the library. They could be of any wetland, from puddles and storm water drains to creeks and lakes to estuaries and coral reefs. The pictures should have some animals represented in them to help with the investigation activity. In pairs, have each student identify and classify one wetland picture. • Have students justify their answer and provide any background information – e.g. animals or plants they can see, a similar wetland they may know about or have been to, an issue they can see affecting the wetland. • On each large sheet of paper, write down one wetland as the title. This will be used for the investigation activity. Teachers may choose to focus on specific wetlands, or discuss with the students which wetlands they will focus on (perhaps use local examples here). As some wetlands won't have many animals, some pairs may be able to investigate two different types of wetlands. • If some of the pictures are small enough and able to be used in the display, they could be stuck onto the large sheet of paper. **Investigation** – What different types of animals live in wetlands? • Use the food web diagram from the GBRMPA Reef Beat 2006, poster 5 – Aquatic Food Webs as a stimulus for students to identify and list animals that live in wetlands (use the WetlandInfo site as it has species lists for wetlands in different regions http://wetlandinfo.derm.qld.gov.au/wetlands/factsfigures.html). As a class make a list of animals. Ask students to name other animals they know rely on wetlands for survival. Students may also identify animals from their pictures in the introduction activity. This list should be quite extensive. • Split students into pairs and assign each pair a specific type of wetland. Ask each pair to use the list of animals to write down those animals they think live in their type of wetland. Have the Internet and books available for students to check on animals they are unsure about. Different pairs could discuss and check answers. Ask pairs to briefly share answers. Encourage students to make the connection that some animals are found in a variety of wetlands. • When pairs have finished, explain that they are going to classify their animals into classes. Explain that scientists classify animals in different ways. There are six main classes – mammals, birds, fishes, reptiles, amphibians and invertebrates. Each pair should be given a copy of Resource 4. Read through and find examples	**Lesson 5** Formative assessment opportunities: - observations and records of what students have written in their science journal in regards to what they have learnt and remembered.		**Lesson 5** A range of pictures of different kinds of wetlands. Large sheets of paper for display of different types of animals in wetlands. Coloured sticky notes or coloured paper cut up into squares – six different colours are needed. GBRMPA Reef Beat 2006, poster 5, Aquatic Food Webs www.gbrmpa.gov.au Science Castle has good information on classifying animals – www.sciencecastle.com WetlandInfo http://wetlandinfo.derm.qld.gov.au/wetlands/factsfigures.html and http://wetlandinfo.derm.qld.gov.au/wetlands/ScienceAndResearch/ConceptualModels/Palustrine/MainFPGSHS.html PBS: good website for animal classification information www.pbs.org/kcet/shapeoflife/ Middle School Science Resources www.middleschoolscience.com

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
for each class. • Have six different coloured piles of paper cut into squares or sticky notes for students to use when they classify their animals. As a class decide which colour will represent each class of animal. Pairs then classify their animals and write the name of each animal on its own piece of coloured paper that matches the appropriate class. • These then get put onto the large sheets of paper from the introductory activity according to the wetland they live in. Group the classes together so students can see the main classes of animals that live in each wetland. • **OPTIONAL extra activity** – have students discuss if the animals identified are native or pest animals. This could be recorded by putting red circles around the names of the animals that are pests. Identify and discuss any patterns that may occur where there are more pests in certain wetlands. Discuss why these patterns might occur and what impact they may have on the different wetlands. • Add words to the word wall and any relevant information to the wetlands tree diagram. • Students add their learning and reflections to their science journal.			Good Website with animal info and games http://www.kidzone.ws/animals/ Resource 4 – Animal Classification Information.
Lesson 6 – Food chains in wetlands **OPTIONAL LESSON** – If students have enough experience with food chains to be able to continue through the unit without this lesson, teachers may choose to skip this lesson and simply revise food chains as they move onto Lesson 7. **Lesson time** – 1 hour **Introduction** – What is a food chain? • As a class, revise the lists of wetland animals made in Lesson 5. Give the class an example of a food chain from a wetland e.g.: ○ sun>algae>water invertebrates>small fish>water birds • Explain that food chains show how each living organism gets its food. As a class work out some more food chains, some from wetlands and some from more familiar contexts. Students may need books and the Internet to research some food chains. Write these on large sheets of paper for use in Lesson 7. • Discuss with students the role of the sun and plants in each food chain. Ask students - can a food chain exist without the sun or without plants? Discuss the students' answers. **Investigation** – Making food chains • Create food chains to hang in the classroom. Cut strips of paper approximately 5cm	**Lesson 6** Formative assessment opportunities: - anecdotal records of students' ability to correctly identify food chains in a variety of wetlands. - anecdotal records of students' ability to complete a futures circle and engage in the skills required.		**Lesson 6** Large sheets of paper for display Strips of paper to make food chains (approx 5cm by 20cm, scrap A4 paper cut into strips will be fine) Sticky tape or staples to join food chains Wool or string to hang food chains

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
wide by 20cm long to make paper chains. On each strip write in large letters and draw the specific element of a wetland food chain the students decide on. Link the chains together in the correct order using sticky tape or staples. Hang the food chains ensuring that the food chain is hanging with the top of the food chain (i.e. the water birds in the above example) at the top. This will help students visualise which animals are at the top of a food chain and those which are at the bottom. • Discuss with students what happens to the balance of the food chain when one element is taken out. Physically demonstrate this with one of the food chains students made. Make a list of things, both natural and artificial, that could impact the food chains in wetlands. Display these for future reference. • Complete a Futures Circle with the class (see Resource 5) and discuss the impacts of both natural and artificial events on food chains in wetlands. Students could then complete their own futures circle on a certain event. • Add words to the word wall and any relevant information to the wetlands tree diagram. • Students add their learning and reflections to their science journal.			Many food chain examples and games are available on the Internet. One good one is at Eco Kids www.ecokids.ca It also looks at what happens when an element is taken out of the food chain. Resource 5 – Futures Circle.
Lesson 7 – Food webs in wetlands **Lesson time** – 1 hour **Introduction** – What is a food web? • As a class, look again at the GBRMPA Reef Beat 2006, poster 5 – Aquatic Food Webs. Read the poster together, adding words to the word wall and discussing interesting facts e.g. the role of mangroves and fish that move from saltwater to freshwater. • Discuss what food webs are, drawing students' attention to the fact that food webs are several food chains linked together into a web. As a class, write a definition of a food web. • Using the food chains written down in the introductory activity, as a class, draw a food web for a specific wetland. • Ask students to identify the four levels of the food web – source > producer > consumer > decomposer. • Add to the food web definition, the class thoughts on the role of each of the four levels and the importance of each role in the cycle of life. Display this definition. **Investigation** – Creating food webs • In pairs or groups, ask students to draw their own food web from a specific wetland using the list of animals from Lesson 5. Students may need to refer to books or the	**Lesson 7** Formative assessment opportunities: - anecdotal records of students' ability to correctly identify food webs in a variety of wetlands. - anecdotal records of students' ability to complete a futures circle and engage in the skills required.		**Lesson 7** GBRMPA Reef Beat 2006, poster 5 – Aquatic Food Webs www.gbrmpa.gov.au Books on wetlands for students to research food webs. Internet access for food web research. Resource 5 – Futures Circle.

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
Internet for research. Some wetlands may not have large food webs, while others will have very extensive food webs. Make sure all wetlands from Lesson 5 are represented with a food web. • Allow time for students to share their food webs with the class, identifying the four levels of their food web. • Complete a futures circle with the class (see Resource 5) and discuss the impacts of both natural and artificial events on food webs. Add to the list made in Lesson 6 (or start a list if necessary). Discuss further how these events then impact the wetland, the local environment, the wider community, businesses, tourism, the reef and other far reaching effects. Students could go on to complete their own futures circle for a different event. • Add words to the word wall and any relevant information to the wetlands tree diagram. • Students add their learning and reflections to their science journal.			
ELABORATE – To build understanding through an investigation **Lesson 8** – How it all links together **Suggested time** – 1 – 2 hours; however this will depend if the class draws or builds a model of a wetland. Building a model will take a lot more time and organisation, but could be incorporated into other KLA such as arts and maths if time permits. **Introduction** – Review • Do a walkthrough of information already gathered on wetlands – TWLH chart, word wall, tree diagram, information posters, student written information reports, science journals. Encourage students to comment on their learning or add information to the displays they may think is important. • Read the GBRMPA Reef Beat 2006 – "It's all connected" poster. • Discuss the water flow –from source to sea. As a class, draw a rough sketch of a local waterway – from source to sea. **Investigation** – Drawing or building a wetland • If building model of a wetland – split the class into groups and decide which group will build which wetland. Each group should build a different wetland. In groups find different items around the school that could represent different parts of the wetland. Students may need to research their wetland via book, posters or the Internet first. Students should discuss and draw plans as to how they are going to construct the wetland before they begin. Construct the wetland. Depending on the needs of the class, this may be done over a number of lessons or during other KLA time.	**Lesson 8** Summative assessment opportunities: - observe research and analytical skills students use to complete their model/drawing of a wetland. - students' models or drawings could be used to assess their knowledge of how wetlands fit together and function effectively (science understandings). - students' responses to discussion questions could be used to assess their science understandings and		**Lesson 8** GBRMPA Reef Beat 2006, poster 4 – It's all connected www.gbrmpa.gov.au Queensland Wetlands Program www.wetlandinfo.derm.qld.gov.au/wetlands/ScienceAndResearch/ConceptualModels.html OzCoast's website at http://www.ozcoasts.gov.au/conceptual_mods/cm_build.jsp Resources for building or drawing wetlands.

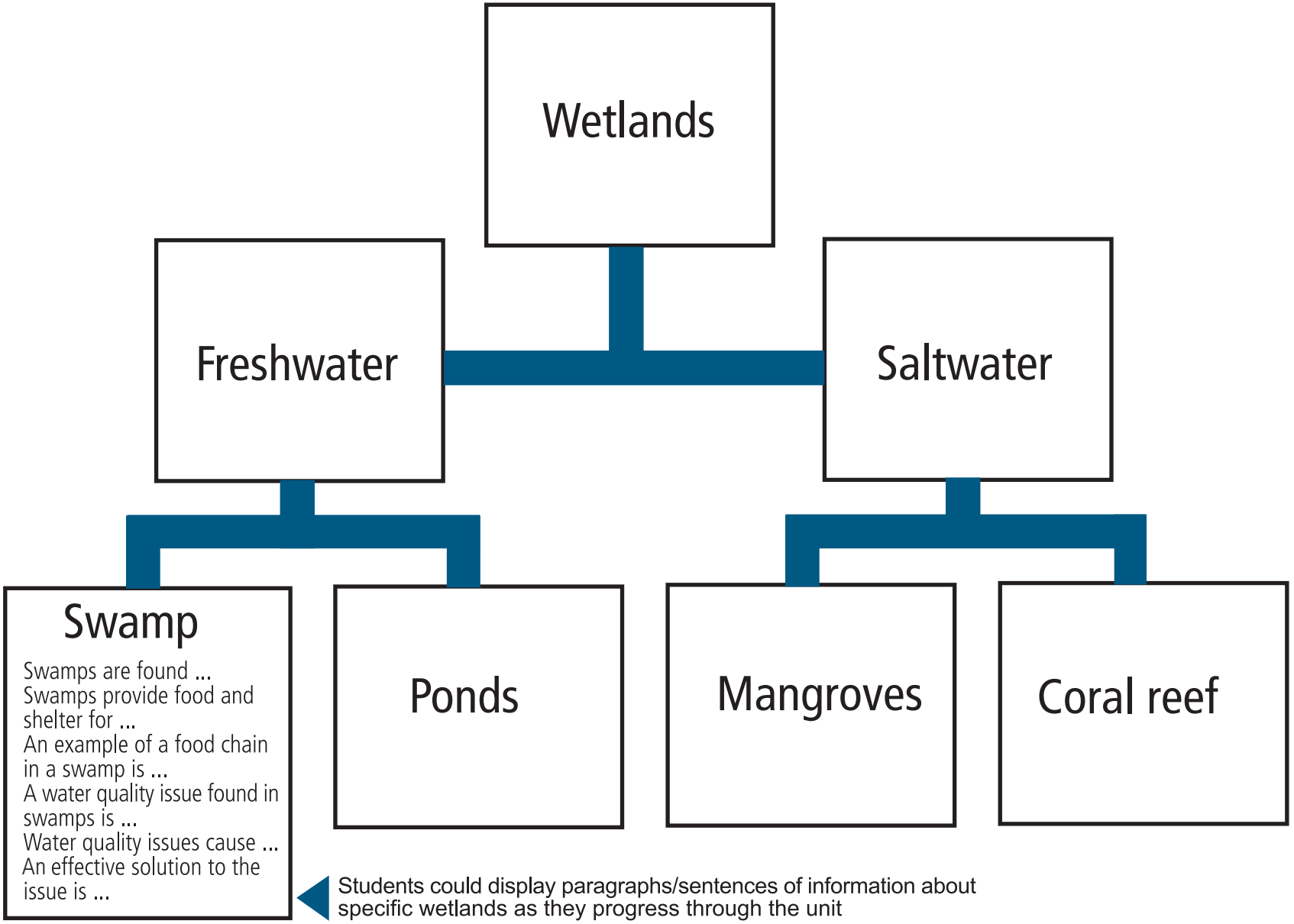
Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
• Label parts – groups should discuss and prepare labels for the different parts of each wetland. • If drawing a wetland, this could be done individually or in pairs. Assign each student, or pair of students, a wetland. Students will need to investigate their wetland via books, poster and the Internet to draw a cross section of their wetland. Students will need to label all the parts of the wetland and also represent the food web of their wetland. The example of a cross section on the GBRMPA Reef Beat 2006, poster 5 – Aquatic Food Webs, will help students to understand what a cross section picture should look like. • When students have finished their construction or drawing of a wetland, they present their representation to the class and answer some questions. The following questions are examples: o What sort of wetland is it? Where could it be located within the Australian environment? o What is an example of a food web in your wetland? o What are the differences and similarities between your wetland and others you have observed? o Where will the water flow in and out of the wetlands? E.g. across the land, rivers and creeks, groundwater. o Does the weather affect this? What will happen in extreme weather? o How might landuse such as urban development affect the wetland? o How might landuse such as farming affect the wetland? o How can landuse be managed to minimise its impacts on the wetland? • Students add their learning and reflections to their science journal. **Lesson 9** – Health of Wetlands **Suggested time** – 1 hour **Introduction** – Why do wetlands need to be healthy? • As a class, read the GBRMPA Reef Beat 2006, poster 6 – Wetland Values. • **OPTIONAL extension activity** - As a class, complete a futures circle (see Resource 5) with the Great Barrier Reef as the wetland. Decide on an event together and use the information in the poster to fill in all the areas of the futures circle. • Brainstorm ideas about why wetlands need to be healthy. Record the students' responses on a large sheet of paper and display this in the room.	science as a human endeavour. **Lesson 9** Summative assessment opportunities: - students' collection and analysis of data could be used to assess their scientific inquiry skills.		**Lesson 9** GBRMPA Reef Beat 2006, poster 6 – Wetland Values www.gbrmpa.gov.au Resource 5 – Futures Circle Large sheets of paper for brainstorming 'A Waterways Health Check' resource from www.waterwatch.org.au

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
Investigation – How to test if a wetland is healthy • Explain to students that they are going to go on a virtual field trip of a wetland. They will learn how to test the water quality of a wetland to determine if it is healthy or unhealthy. Before they start they will need to do a bit of reading about the different tests they will be conducting. Break the class up into six groups. Give each group a copy of the information on one of the tests (Benthic Macro Invertebrates, PH, Dissolved Oxygen, Turbidity, Temperature and Riparian Environment and Aquatic Plants). Each group needs to read the information and share with the rest of the class what the test does and why they think it is an important test to be conducted. Record the students' ideas on paper for display and also for students to reflect on and adjust ideas later on as necessary. • Students add their learning and reflections to their science journal. **Lesson 10** – Excursion to a wetland **Suggested time** – this will depend on where the wetland is and how long the class spends at the wetland. Teachers may also decide that a number of visits are necessary. **Introduction and Investigation** – Excursion • Activities completed at the wetland will depend on the wetland visited, resources available, student expectations and teacher expectations. • The aim of the excursion is for students to gain real life experience diagnosing a wetland and thinking about the proper management of wetlands to keep them healthy, and why they need to be kept healthy. • Some suggestions of activities include: o Sketch the site, where does your wetland fit into the landscape? o What are the adjacent land uses around your wetland? Is it being impacted from these uses? o Where does the water come from to nourish your wetland? Is this source natural or artificial (e.g. stormwater)? o Survey the animals seen at the wetland (take notes on food chains and food webs). o If the wetland is in poor health, look at ways the school or class could be involved in its rehabilitation. o If the wetland is healthy, look at reasons why it is healthy and ways the school could be involved to maintain the wetland. o Interview a person that may know about the wetland e.g. a local council representative, a local scientist, a person from a local organisation that	**Lesson 10** Summative assessment opportunities - student participation in collecting data, questioning and proposing ideas could be used to assess their science inquiry skills.		**Lesson 10** Teachers will need to organise the excursion to a wetland. There may be a number of wetlands available in your local area or just one. You may also need to organise resources to conduct tests, this will depend on what you decide to do during the excursion. 'A Waterways Health Check' resource from www.waterwatch.org.au

Teaching and learning		Supportive learning environment	
Teaching strategies and learning experiences	**Assessment opportunities**	**Adjustments for needs of learners**	**Resources**
helps to look after the local wetlands, an Indigenous representative who would have information in regards to the traditional knowledge of the wetland and the surrounding areas, a person who has lived in the area for a long time and would know about the changes in the wetland over the years. ○ Photograph the wetland to use in the creation of a book about wetlands. • Students add their learning and reflections to their science journal.			
EVALUATE – To review and reflect on learning **Lesson 11** – Presentation preparation **Suggested time** – 1 hour **Introduction** – Task Sheet • Explain to the students that they are going to begin their final assessment presentation. Present them with a task sheet (Resource 6). • Read through the task sheet together and identify all the requirements of the task. Teachers may also show students the guide to making judgements or create a simpler version for students to use as a guide when preparing their presentation. • Discuss available resources (identify all the work done throughout the unit that will help the students complete the task). • Set out a plan for time management and resource management. **Investigation** – Start preparing presentations • Allow students time to research and prepare their presentation. • Students may need scaffolding for the different parts of the presentation. This will depend on the need of the class. **Lesson 12 and Lesson 13** – Continue presentation preparation. **Suggested time** – How much time students are able to spend preparing their presentations will depend on the needs of the class and the length of time available in the school term. **Lesson 14** – Presentation. **Suggested Time** – 1–2 hours Prepare an audience for the students to present their presentations to. Some presentations could be done during school parade, or filmed and shown to other classes. Parents and other school and community members could be invited to watch the presentations.	**Lesson 11 – 14** Summative assessment opportunities: - student presentation can be used to assess students' knowledge and understanding of science understandings, science as a human endeavour and science inquiry skills.		**Lesson 11** Resource 6 – Task Sheet.

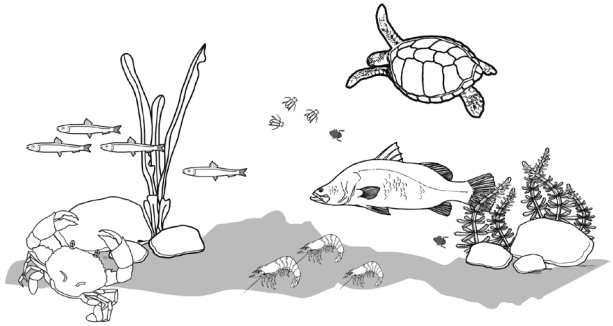
Use feedback (these are some suggestions, teachers will need to vary this according to the needs of their class)	
Ways to monitor learning and assessment	Year 7 teacher: • Initially plan the teaching, learning and assessment needs of all learners and make adjustments to the unit plan as necessary • Use diagnostic, formative and summative assessment opportunities throughout the unit to plan for students learning and assess student knowledge development • Mark presentations and moderate with colleagues to achieve consensus and consistency of teacher judgment
Feedback to students	Teachers: • Plan opportunities for conversations to provide ongoing feedback (spoken and written) and encouragement to students on their strengths and areas for improvement • Reflect on and review learning opportunities to individualise learning experiences required • Provide multiple opportunities for students to experience, practise and improve knowledge, processes and skills Students: • Identify what they can do well and what they need to improve • Provide feedback to a peer on interaction skills and suggest some strategies for improvement (written and spoken feedback)
Reflection on the unit plan	At the conclusion of the unit teachers can reflect on the unit for future planning by answering the following questions: • What worked well in this unit? • What was a stumbling block? • How would you refine it? • What trends and gaps in learning have you identified? • How will you build on these learning experiences next term and beyond?

Resource 1 – Example of information display for students to add to as they gain more complex knowledge of wetlands. This information will be utilised as a part of their final assessment piece.



Resource 2 – Procedural Text - *What do wetlands do?*

Aim	
	To find out what wetlands do
Materials	
	• Water • Items to be washed into the wetland e.g. sediment (pebbles, stones, dirt, sand, grass clippings, leaves) • Items to act as the wetland filters e.g. sponges, coffee filters, old socks or pieces of material, kitchen strainer, sieve. Try to use a variety of materials with different sized filtration and absorption abilities. • Container e.g. a large mixing bowl, a bucket or jar with a lid, to mix water and items washed into wetland. • A sink or tray to catch the water.
Procedure	
	1. In groups or pairs, complete the investigation planner to organise how you will complete the investigation. 2. Mix your chosen sediment and water in your container. 3. Tip the sediment and water through your chosen filter (someone may need to hold the filter) into the sink or tray to catch the water. Make sure you have a plug in the sink if you are tipping the water into a sink. 4. Record what sediment was caught by the filter. For larger items, such as stones, you may be able to count the amount caught and the amount that got through into the sink. For smaller items such as sand and dirt, you may be able to make an observation about how much is in the filter and how much is in the sink. 5. Repeat the investigation for different types of sediment and different types of filters. 6. Record your observations on the Explaining Your Results page. 7. Share your results with the class.



Resource 3 – Investigation Planner

Name: ..... **Date:** .....

Other members of your team: .....

What are you going to investigate?	**Hypothesis.** What do you think will happen? Explain why.

To make the test fair, what are you going to do?

Change? Change only one thing. **Independent Variable**	**Measure?** What would be affected by the change? **Observe**	**Keep the same?** Which variables will you control? **Dependent Variables**
Illustrate how you will set up your investigation **Labelled Diagram**	What equipment will you need? **Equipment**	How will you complete the investigation? Use dot points. **Procedure**

Resource 3 – Investigation Planner *(cont.)*

Explaining Results

When you changed the_____what happened?

Why did this happen?	**Was your hypothesis accurate?**
What challenges did you have in doing this investigation?	**How could you improve this investigation?** **What would you investigate next?** **Fairness? Accuracy?**

Teacher Comments: .....

.....

.....

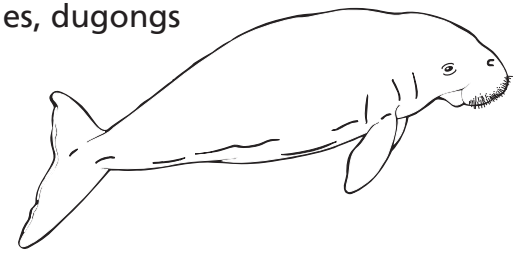
Resource 4 – Animal Classification - *Classes*

(Information collected from a range of Internet resources - Science Castle www.sciencecastle.com, PBS www.pbs.org/kcet/shapeoflife/ and Middle School Science Resources www.middleschoolscience.com)

Mammals

Mammals are animals that have hair on their body and drink milk when they are a baby. The platypus is one of only three mammals that lay eggs. All other mammals give birth to live young.

Examples – dogs, horses, kangaroos, whales, dugongs



Birds

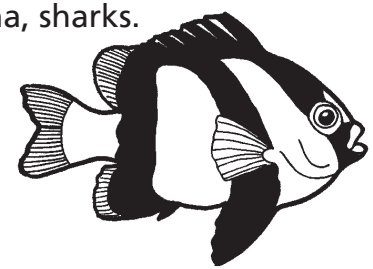
Birds are born out of a hard shell and they all have feathers. Not all birds can fly. The cassowary and the emu are two birds that cannot fly.

Examples – ducks, flamingos, ibises, swans.

Fishes

Fish live in freshwater or saltwater. They have a backbone and use gills to breath. Fish also have scales and fins on their bodies. The barramundi is a fish that can live in both freshwater and saltwater.

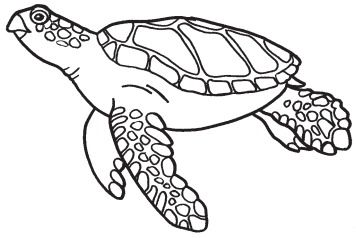
Examples – mackerel, groper, mangrove jack, tuna, sharks.



Reptiles

Reptiles are born on the land. All reptiles have scaly skin and are cold blooded animals. Some reptiles lay eggs, such as turtles, and some reptiles give birth to live young, such as blue tongue lizards.

Examples – turtles, lizards, snakes, crocodiles.



Amphibians

Amphibians are animals that start their life in the water. They are born in the water and have gills to breath. As they grow up, they develop lungs and can live on the land. All amphibians need water to breed.

Examples – frogs, salamanders, toads.

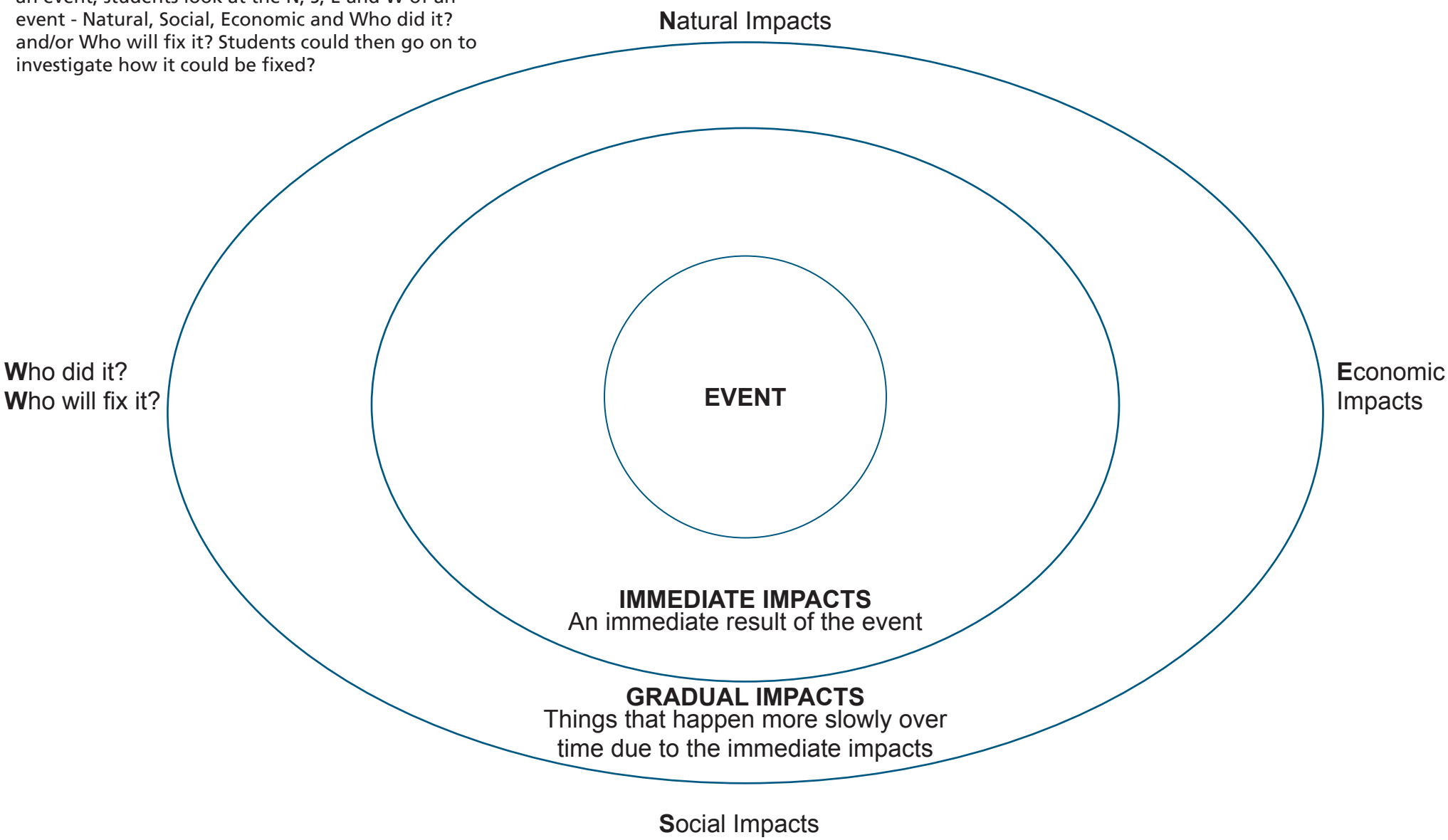
Invertebrates

Invertebrates all have one thing in common – they have no backbone. Invertebrates are the largest class of animals with over 95 per cent of all animals belonging to this class.

Examples – spiders, insects, crabs, barnacles, scorpions

Resource 5 – Futures Circle

Students identify a certain event. As they move out of the circle, they define what gradually happens due to the event. For more advanced analysis of an event, students look at the N, S, E and W of an event - Natural, Social, Economic and Who did it? and/or Who will fix it? Students could then go on to investigate how it could be fixed?



Resource 6 – Student Task Sheet

Wetlands – Year 7 Scientific Report

Your Task:

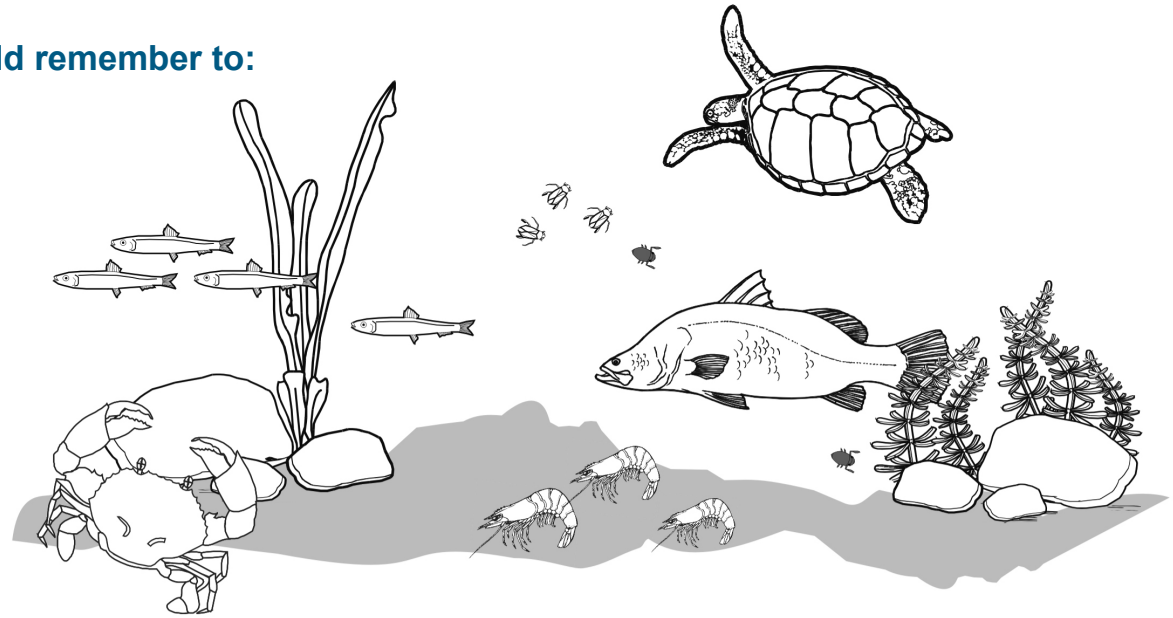
You are required to prepare a scientific report on wetlands. You will present this report to your peers as well as other members of your school and community who may be in the audience.

In your report you must include the following information:

- An example of a pristine wetland and a wetland under threat.
- Information about both wetlands explaining how you know one is pristine and the other one is under threat.
- A poster of each wetland (you will need to explain each poster and the diagrams in your oral presentation). Each poster will include:
  - → A labelled cross section of the wetland
  - → A labelled diagram showing how the wetland fits into the water cycle
  - → A food web found within the wetland.
- Identify and explain at least four threats that have caused the under threat wetland to become unhealthy.
- Identify and explain at least four solutions to fix the four threats you have identified.

When preparing and presenting your report you should remember to:

- ✓ Use scientific terms you have learnt
- ✓ Prepare and label your posters neatly
- ✓ Research your wetlands to make sure the information you collect is correct
- ✓ Speak clearly
- ✓ Be confident



Year 7 Science: Wetlands – *Oral Presentation*

Name: _____

Purpose of assessment: Develop an oral presentation to share scientific knowledge of both pristine and under threat wetlands. Annotated diagrams of wetlands, water cycle and food webs should be included in the presentation.

Knowledge and Understanding		Skills	
Science Understanding	Science as a Human Endeavour	Science Inquiry Skills	
Biological Science - A poster of a pristine wetland and a poster of a wetland under threat. Each poster will include • Information on both a pristine and under threat wetland and the differences between them. • Annotated diagram of cross section of the wetland • Annotated diagram of the interactions between wetland biota (in food web format). **Earth and Space Sciences** • Annotated diagram of how the wetland fits into the water cycle (for each poster).	**Nature and Development of Science** - Selecting scientific evidence to make judgements on similarities and differences between pristine and under threat wetlands. **Use and Influence of Science** - Identify and explain threats that can result in an "under threat" wetland - Identify and explain solutions to identified threats to wetlands.	**Questioning and Predicting** - Participating in investigations by questioning and making predictions based on scientific knowledge. **Planning and Conducting** -Planning, gathering and recording information appropriately. **Processing and Analysing Data and Information** - Use scientific information and data to understand and explain natural and threatening process relating to wetlands and their inhabitants.	**Evaluating** - Use scientific information and data to understand and explain natural and threatening processes relating to wetlands and their inhabitants and ways to improve under threat wetlands. **Communicating** - Ability to orally describe and share knowledge, observations and ideas about wetlands in a scientific context. - Ability to construct scientifically accurate, clear and annotated diagrams of pristine and under threat wetlands, the water cycle inclusive of a wetland and the interactions between wetland biota (food web format).
The student proficiently identifies, describes and provides annotated diagrams of both pristine and under threat wetlands. They correctly identify and describe the importance of the role of wetlands within the water cycle and display this with a diagram. They provide precise diagrams and descriptions of food webs within both wetlands, outlining the differences between them.	Students' explanations are reasoned and justified using multiple links to knowledge and evidence with reference to specific wetlands. They accurately identify and analyse four threats to wetlands and propose real life solutions to each threat based on investigations and scientific knowledge.	Students' questioning is original and explicitly linked to scientific investigations. They provide a very high level of detailed, concise and appropriate information gathered and recorded during investigations.	The student uses scientific language to describe wetlands using eight scientific terms with no prompting. All diagrams are correct, accurately annotated and neat. The water cycle diagram demonstrates a very high level of understanding of the role of wetlands within the water cycle. Solutions posed show a detailed understanding of the complex inter-relatedness of wetland ecosystems and processes.	A
The student identifies, describes and provides annotated diagrams of both pristine and under threat wetlands. They correctly identify and describe the role of wetlands within the water cycle and display this with a diagram. They provide correct diagrams and descriptions of food webs within both wetlands.	Students' explanations are linked to knowledge and evidence with reference to specific wetland types. They describe two threats to wetlands and propose real life solutions to each threat based on investigations and scientific knowledge	Students' questioning is relevant and identifies questions and problems that can be investigated scientifically. They provide some precise and appropriate information gathered and recorded during investigations.	The student uses some scientific language to describe wetlands using four scientific terms with no prompting. All diagrams are correctly annotated. The water cycle diagram demonstrates a sound level of understanding of the role of wetlands within the water cycle. Solutions posed show an understanding of the inter-relatedness of wetland ecosystems and processes.	B / C
The student describes and provides a simple diagram of both pristine and under threat wetlands. They describe the role of wetlands and display this with a diagram. They provide simple diagrams and descriptions of food webs within a wetland.	Student requires prompting to draw connections between knowledge and evidence and apply this to wetlands. They identify one threat to a wetland and pose one solution for future management of the under threat wetland.	Some of the students' questioning is relevant with some simple statements about wetlands provided. They provide some appropriate information gathered and recorded during investigations.	The student uses everyday language to describe wetlands. Some annotated diagrams are provided. A correct diagram of the water cycle is provided. Solution posed shows a basic level of understanding of wetland ecosystems and processes.	D / E

Year 7 Science: Wetlands – Oral Presentation Name: _____

QSA Literacy indicators		✓
Speaking and Listening		
SL7 vii.	Plan and organise spoken presentations for a specific purpose, applying the structures and features that best suit the context.	
Writing and Designing		
WD7 x.	Select technical or literary language that accurately identifies important concepts or features, clarifies relationships that exist between them and maintains these relationships with context-specific vocabulary and related words.	

Feedback:……

……

……..

……

……..

……

……..

……

……..

……

……..

……

……..

……

……..

……

……..