Wetlands

Year 7

Learning area: Science

Science Understanding (sub-strand):   
Biological sciences and   
Earth and space sciences

© Commonwealth of Australia 2016  
Published by the Great Barrier Reef Marine Park Authority

Copyright - CC BY NC SA  
With the exception of the Commonwealth Coat of Arms, content supplied by third parties, logos and other material protected by a trademark, the content of this publication is licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Licence.

A summary of license terms is available from:  
<http://www.creativecommons.org/licenses/by-nc-sa/3.0/>

The full license terms are available from:  
<http://www.creativecommons.org/licenses/by-nc-sa/3.0/legalcode>

**This publication should be cited as:**

Great Barrier Reef Marine Park Authority 2015, *Wetlands: Year 7 Australian science curriculum focus*, GBRMPA, Townsville.

**National Library of Australia Cataloguing-in-Publication entry**

Wetlands: year 7 Australian science curriculum focus / Great Barrier Reef Marine Park Authority.

ISBN 9781922126689

Wetlands—Australia—Study and teaching (Secondary).

Wetland ecology—Australia—Study and teaching (Secondary).

Wetlands—Environmental aspects—Australia—Study and teaching (Secondary).

Great Barrier Reef (Qld.)—Study and teaching (secondary).

Great Barrier Reef Marine Park Authority.

577.680994

In this unit, the sections *‘Curriculum intent’*, *‘Assessment – Assessing student learning’* and *‘Making judgements – achievement standard’* include content that is © Australian Curriculum, Assessment and Reporting Authority (ACARA) 2010 to present, unless otherwise indicated. This material was downloaded from the [Australian Curriculum](http://www.australiancurriculum.edu.au/) website (accessed March 2015) and was modified. The material is licensed under [CC BY 4.0](https://creativecommons.org/licenses/by/4.0). Version updates are tracked on the [Curriculum version history](http://www.australiancurriculum.edu.au/Home/CurriculumHistory) page of the Australian Curriculum website.

ACARA does not endorse any product that uses the Australian Curriculum or make any representations as to the quality of such products. Any product that uses material published on this website should not be taken to be affiliated with ACARA or have the sponsorship or approval of ACARA. It is up to each person to make their own assessment of the product, taking into account matters including, but not limited to, the version number and the degree to which the materials align with the content descriptions (where relevant). Where there is a claim of alignment, it is important to check that the materials align with the content descriptions (endorsed by all education Ministers), not the elaborations (examples provided by ACARA).

**Comments and inquiries on this document should be addressed to:**

Great Barrier Reef Marine Park Authority

2-68 Flinders Street  
PO Box 1379  
TOWNSVILLE QLD 4810  
Australia  
Phone: (07) 4750 0700  
Fax: (07) 4772 6093  
info@gbrmpa.gov.au

<http://www.gbrmpa.gov.au>

Wetlands — Year 7

**Contents**

[Unit overview 5](#_Toc443483787)

[Teacher information 6](#_Toc443483788)

[Curriculum intent 12](#_Toc443483789)

[Feedback 18](#_Toc443483790)

[Assessment 19](#_Toc443483791)

[Sequencing teaching and learning 21](#_Toc443483792)

[Making judgements 23](#_Toc443483793)

[Teaching sequence 24](#_Toc443483794)

[Resources 61](#_Toc443483795)

[Resource 1 – Word bank 62](#_Toc443483796)

[Resource 2 – Student reflections 63](#_Toc443483797)

[Resource 3 – Information tree diagram of wetlands 64](#_Toc443483798)

[Resource 4 – Wetlands filter experiment 65](#_Toc443483799)

[Resource 5 – Animal classification – Classes 67](#_Toc443483800)

[Resource 6 – Future circles 68](#_Toc443483801)

[Resource 7 – Student task sheet and Guide for making judgements 69](#_Toc443483802)

# Unit overview

| Unit title | Wetlands |
| --- | --- |
| Learning Area | Science |
| Science Understanding (sub-strand) | Biological sciences and Earth and space sciences |
| Year level | 7 |
| Duration | Approximately 10 weeks (21 lessons)\*  \*based on approximately 2 lessons of science per week for Year 7  (50 minutes per lesson) |
| Unit description | In this unit, students will investigate different wetland types. They will describe how wetlands are part of the water cycle. Students will identify different animals that live in wetlands and group and classify them. Students will recognise and understand the interactions between living things in food chains and food webs in a wetland, and how human activity can affect these interactions. Students will understand and investigate water health of a wetland and consider threats to wetland health and how to manage it. |

# Teacher information

## Safety and risk management

You will need to identify safety issues and conduct your own curriculum activity risk assessments for all activities and excursions in this unit.

For advice and documents refer to the Department of Education and Training Curriculum Activity Risk Assessment Guidelines: <http://education.qld.gov.au/health/safety/hazards/curriculum-activities.html>

The actual risk level for activities in this unit will vary according to the specific circumstances of the activity and your school and classroom context. You must consider all circumstances when you complete a risk assessment. Examples of considerations include, but are not limited to:

Is the activity occurring within or outside of school grounds e.g. an excursion?

Will students be in the sun? What sun protection will students have?

How will students be supervised during the activity?

What will students do during the activity?

Are there any special student considerations e.g. medical, behavioural or special needs?

What hazards do you need to take into account e.g. hazardous substances, tools or equipment? Potential for insect bites? Locational hazards e.g. slipping, falling?

## Unit details

The Great Barrier Reef Marine Park Authority (GBRMPA) Wetlands is a Year 7 Science unit of work. The content descriptions for this unit are from the Australian Curriculum: Science (Version 7.4 dated 30th March 2015 <http://www.australiancurriculum.edu.au>).

The unit follows the inquiry-based 5Es approach to teaching science. The inquiry questions that underpin the unit are:

What are wetlands and how are they classified?

What is the importance of water cycles in wetlands?

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?

Why are wetlands such an important part of the Australian environment?

How does nature and humans impact the water cycle in different wetlands?

What recommendations could be made to care for and improve the quality of wetlands in Australia?

## Time allocation

The unit is based on approximately two lessons of science per week for Year 7 students. Each lesson is approximately 50 minutes long.

The overall unit, or the individual lessons, can be extended or shortened to cater for individual classes as deemed necessary by the class teacher.

## Unit aims

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 – background information’ and also <http://www.gbrmpa.gov.au>).

Teaching students about wetlands will build their environmental knowledge and encourage their understanding of sustainability and stewardship.

Key threats to the Reef

GBRMPA encourages teachers, students and communities to follow the main aim of Reef Guardians – to be custodians of their local ecosystems and stewards of the Reef. In the Great Barrier Reef Outlook Report 2014, the key threats to the Reef are identified as climate change, land-based run-off, coastal development, and other direct impacts such as unsustainable fishing activities and marine debris. (See [http://www.gbrmpa.gov.au](http://www.gbrmpa.gov.au/) for more information on the Outlook Report 2014).

In this unit, students explore water and water quality, and consider the affect that coastal ecosystems, especially wetlands, have on the health of the Great Barrier Reef. Students consider what attributes are required to have a wetland function optimally as well as what they can do to improve the health of their local waterways.

## Stewardship

The Reef Guardian Schools Program encourages responsible use and protection of the Great Barrier Reef ecosystems. Schools are encouraged to take ownership of conservation activities and on-ground projects that involve students, teachers and their local communities. These environmental actions foster a greater appreciation and understanding of the Great Barrier Reef and empower students to become lifelong stewards.

The following are examples of stewardship activities that relate to the learning experiences of this unit:

* Devise a process and engage in a clean-up of local stormwater drains.
* Work with local management groups and find out what can be done to improve the health of a wetland.
* Study, contrast and compare different types of wetlands in your local catchment.
* Adopt a local wetland (preferably close to or inside the schoolyard).

Citizen science participation

Citizen science is scientific research conducted by non-professionals – in this case by students, teachers and communities. Schools can participate in the collection and submission of scientific data to local management authorities including GBRMPA, local councils and local Natural Resource Management agencies where the data can be used to inform sustainable ecosystem management decisions.

Examples of citizen science participation are provided in the lesson plans of this unit found in the ‘Teaching sequence’ section.

## Building partnerships

Delivery of this unit can be enhanced by building partnerships within the school and wider community.

Partner organisations could include the following:

* Great Barrier Reef Marine Park Authority
* local council
* Local Marine Advisory Committees (LMAC)
* your nearest Natural Resource Management organisation (NRM): <http://www.nrm.gov.au/regional/regional-nrm-organisations>
* Wetland Care Australia
* Local universities, especially if the wetland is being studied
* Queensland Parks and Wildlife Service

Background information – Wetlands

### 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 run-off 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.

Useful websites

ABC Science – Catchment Detox Game:  
<http://www.catchmentdetox.net.au/>

Department of the Environment:  
<http://www.environment.gov.au>

EcoKids:  
<http://www.ecokids.ca>

Great Barrier Reef Marine Park Authority:  
<http://www.gbrmpa.gov.au>

Queensland Wetlands Program:  
<http://www.wetlandinfo.derm.qld.gov.au>

Healthy Waterways:  
<http://www.healthywaterways.org>

Middle School Science Resources:  
<http://www.middleschoolscience.com>

The Biology Corner:  
<http://www.biologycorner.com>

Department of the Environment – Water education resources:  
<http://www.environment.gov.au/water/information/education>

Water Science School – water quality resources and photo gallery (USA):

<http://water.usgs.gov/edu/waterquality.html>

<http://water.usgs.gov/edu/photo-gallery.html>

Stream Scene – Measure the health of a freshwater stream - water quality monitoring game:  
<http://www.sustainableschools.qld.edu.au/steamscene/StreamScene.swf>

WetlandCare Australia (good images of wetlands):  
[http://www.wetlandcare.com.au](http://www.wetlandcare.com.au/)

Some informational videos about ecosystems which includes rivers, mangroves, reef systems:  
<http://www.gullivermedia.com.au/resources-for-schools/for-schools.php>

Wetland Link International:  
<http://wli.wwt.org.uk/>

## 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://wetlandinfo.ehp.qld.gov.au/resources/static/pdf/resources/reports/qw-rehab-guidlines-jan09.pdf>
* *East Point Mangrove Boardwalk: An Educational Resource Kit for Primary and Junior Secondary Teachers,* Greening Australia NT Inc.
* Engaging with Nature: Freshwater Water Quality Monitoring: Teacher Information Pack:  
  <http://www.naturalresources.sa.gov.au/files/sharedassets/adelaide_and_mt_lofty_ranges/monitoring_and_evaluation/schools/amlr-me-schools-fresh-water-quality-teacher-resource-pack-gen.pdf>

# Curriculum intent

## Australian Curriculum: Science

## Year 7 Level Description

The Science Inquiry Skills and Science as a Human Endeavour strands are described across a two-year band. In their planning, schools and teachers refer to the expectations outlined in the Achievement Standards and also to the content of the Science Understanding strand for the relevant year level to ensure that these two strands are addressed over the two year period. The three strands of the curriculum are interrelated and their content is taught in an integrated way. The order and detail in which the content descriptions are organised into teaching/learning programs are decisions to be made by the teacher.

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.

Content descriptions

This unit provides opportunities for students to engage in the following Australian Curriculum Content descriptions:

| Science Understanding (SU) | Science as a Human Endeavour (SHE) | Science Inquiry Skills (SIS)  *(The SIS descriptions below* ***do not*** *include any SIS covered if students investigate water quality via a wetland excursion. If you conduct an excursion, add relevant SIS to those below).* |
| --- | --- | --- |
| Biological sciences   * There are differences within and between groups of organisms; classification helps organise this diversity [(ACSSU111)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU111) * Interactions between organisms can be described in terms of food chains and food webs; human activity can affect these interactions [(ACSSU112)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU112)   Earth and space sciences   * Water is an important resource that cycles through the environment [(ACSSU222)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU222) | Nature and development of science   * Science knowledge can develop through collaboration and connecting ideas across the disciplines of science [(ACSHE223)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE223)   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 [(ACSHE120)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE120) * Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management [(ACSHE121)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE121) | 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 [(ACSIS125)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSIS125) * In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task [(ACSIS126)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSIS126)   Communicating   * Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate [(ACSIS133)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSIS133) |

Year 7 achievement standard

By the end of Year 7, students describe techniques to separate pure substances from mixtures. They represent and predict the effects of unbalanced forces, including Earth’s gravity, on motion. They explain how the relative positions of the Earth, sun and moon affect phenomena on Earth. They analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems. They predict the effect of environmental changes on feeding relationships and classify and organise diverse organisms based on observable differences. Students describe situations where scientific knowledge from different science disciplines has been used to solve a real-world problem. They explain how the solution was viewed by, and impacted on, different groups in society.

Students identify questions that can be investigated scientifically. They plan fair experimental methods, identifying variables to be changed and measured. They select equipment that improves fairness and accuracy and describe how they considered safety. Students draw on evidence to support their conclusions. They summarise data from different sources, describe trends and refer to the quality of their data when suggesting improvements to their methods. They communicate their ideas, methods and findings using scientific language and appropriate representations.

General capabilities

This unit provides opportunities to address the following organising elements of the general capabilities:

| Literacy   * Comprehending texts through listening, reading and viewing * Composing texts through speaking, writing and creating * Text knowledge * Grammar knowledge * Word knowledge * Visual knowledge | ICT capability   * Investigating with ICT * Creating with ICT * Managing and operating ICT |
| --- | --- |
| Numeracy   * Using measurement | Critical and creative thinking   * Inquiring – identifying, exploring and organising information and ideas * Generating ideas, possibilities and actions * Reflecting on thinking and processes |
| Personal and social competence   * Self-awareness * Self-management * Social awareness * Social management | Ethical understanding   * Reasoning in decision-making and action |
| Intercultural understanding   * Interacting and empathising with others | |

Cross-curriculum priorities

This unit provides opportunities for students to address aspects of the following cross-curriculum priorities:

| Sustainability  Students will:   * recognise the connectedness of living things through ecosystems and that living things depend on healthy ecosystems * identify how scientific knowledge including understanding environments informs personal and community decisions and actions for a sustainable future * understand that a sustainable future involves evaluation of past practises and balanced judgements based on economic, social and environmental impacts. |
| --- |

## Relevant prior curriculum

Students require prior experience from Year 6 with:

### Science Understanding

#### Biological sciences

* The growth and survival of living things are affected by the physical conditions of their environment [(ACSSU094)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU094)

### Science as a Human Endeavour

#### Nature and development of science

* Important contributions to the advancement of science have been made by people from a range of cultures [(ACSHE099)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE099)

#### Use and influence of science

* Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples’ lives [(ACSHE100)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE100)
* Scientific knowledge is used to inform personal and community decisions [(ACSHE220)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE220)

Curriculum working towards

The teaching and learning in this unit works towards the following in Year 8:

### Science Understanding

#### Biological sciences

* Cells are the basic units of living things and have specialised structures and functions [(ACSSU149)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU149)
* Multi-cellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce [(ACSSU150)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU150)

### Science as a Human Endeavour

#### Nature and development of science

* Science knowledge can develop through collaboration and connecting ideas across the disciplines of science [(ACSHE226)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE226)

#### 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 [(ACSHE135)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE135)
* Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management [(ACSHE136)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE136)

# Feedback

## Supportive learning environment

| Differentiation  Consider the individual needs of your students – including gifted and talented, ESL and students requiring additional support.  For information refer to the Australian Curriculum, Assessment and Reporting Authority (ACARA) web pages on student diversity:  <http://www.australiancurriculum.edu.au/studentdiversity/student-diversity-advice>  Further information for Queensland state schools can be found as part of the P-12 curriculum, assessment and reporting framework and associated resources:  <http://education.qld.gov.au/curriculum/framework/p-12/> | 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 it 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? | |

# Assessment

Assessment is the purposeful, systematic and ongoing collection of information as evidence for use in making judgements about student learning and to support improving student learning.

Monitoring student learning

Student learning should be monitored throughout the unit. Each lesson in this unit provides opportunities for monitoring learning and for gathering evidence of student progress. For examples of ways to monitor learning, refer to each of the lesson plans under the section ‘Teaching sequence’.

Assessing student learning

| Summative assessment task: | Wetlands – science report (Lesson 19–21) |
| --- | --- |
| Description: | Students will create a science report on a pristine wetland and a wetland under threat. The report will include cross-sectional drawings of each wetland and diagrams that show how the wetland fits into the water cycle and a food web for each wetland. Students will identify and explain threats for the wetland ‘under threat’ and use science understanding to present solutions for these threats. Students will describe how these solutions may impact human activities. |
| This assessment task provides opportunities to gather evidence of student learning in: | Science Understanding  Biological sciences   * Interactions between organisms can be described in terms of food chains and food webs; human activity can affect these interactions [(ACSSU112)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU112)   Earth and space sciences   * Water is an important resource that cycles through the environment [(ACSSU222)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU222)   Science as a Human Endeavour  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 [(ACSHE120)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE120) * Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management [(ACSHE121)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSHE121)   Science Inquiry Skills  Communicating   * Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate [(ACSIS133)](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSIS133) |

**See Resource section: *Resource 7* for the Student task sheet and the Guide for making judgements for the assessment task: Wetlands – science report.**

# Sequencing teaching and learning

A suggested learning sequence for this unit is summarised below. For detailed information for each lesson in this sequence go to the section ‘Teaching Sequence’.

| Inquiry phase | Lesson | Purpose |
| --- | --- | --- |
| Engage | **Lesson 1:** What do we know about wetlands? | To identify what students know and want to know about wetlands. |
| Explore | **Lesson 2 and 3:** What is a wetland? | To identify and categorise the main types of wetlands and investigate how wetlands filter water. |
| **Lesson 4 and 5:** How does water flow through wetlands? | To identify how water moves through the stages of the water cycle and examine how water flows through wetlands as part of the water cycle. |
| Explain | **Lesson 6:** What types of wetland are there? | To investigate and describe different types of wetlands. |
| **Lesson 7 and 8:** Who lives in wetlands? | To investigate animals that live in different types of wetlands. To classify and group these animals at the class level. |
| **Lesson 9 and 10:** What is a food chain? | To recognise and understand the steps in a food chain from a wetland. To use a futures circle to record and understand the impacts of human activity on a wetland food chain. |
| **Lesson 11 and 12:** What is a food web? | To recognise and understand the parts of a food web from a wetland. To use a futures circle to record and understand the impacts of human activity on a wetland food web. |
| **Lesson 13 and 14:** What threatens the health of wetlands? | To understand the value and benefits of wetlands. To investigate threats to wetlands and their impacts on wetland health. To identify ways to manage wetland health. |
| **Lesson 15:** How can we measure wetland health? | To understand how environmental conditions can affect the health of a wetland. To understand the water quality indicators used to assess water health of a wetland. To recognise how macro invertebrates can be used to indicate water health. |
| Elaborate | **Lesson 16 – 18:** Wetland excursion | To investigate wetlands and examine water quality. To analyse data and observations and draw conclusions on wetland health. To explain what wetland management strategies can be implemented to keep wetlands healthy. |
| **Optional lessons:** Can you create a wetland? | To research and create a model of a wetland. To describe the parts of the wetland, including living things and food webs. To describe impacts on the health of the wetland by humans and natural events. |
| Evaluate | **Lesson 19 – 21:** Reflections and assessment task | To review and reflect on learning and introduce and complete the assessment task. |

**TOTAL: 21 Lessons *(50 minutes per lesson)***

# Making judgements

## Achievement standard

In this unit, assessment of student learning aligns to the following components of the Year 7 achievement standard:

By the end of Year 7, students describe techniques to separate pure substances from mixtures. They represent and predict the effects of unbalanced forces, including Earth’s gravity, on motion. They explain how the relative positions of the Earth, sun and moon affect phenomena on Earth. They analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems. They predict the effect of environmental changes on feeding relationships and classify and organise diverse organisms based on observable differences. Students describe situations where scientific knowledge from different science disciplines has been used to solve a real world problem. They explain how the solution was viewed by, and impacted on, different groups in society.

Students identify questions that can be investigated scientifically. They plan fair experimental methods, identifying variables to be changed and measured. They select equipment that improves fairness and accuracy and describe how they considered safety. Students draw on evidence to support their conclusions. They summarise data from different sources, describe trends and refer to the quality of their data when suggesting improvements to their methods. They communicate their ideas, methods and findings using scientific language and appropriate representations.

## Guide for making judgements

**See Resource section: *Resource 7* for the Student task sheet and the Guide for making judgements for the assessment task: Wetlands – science report.**

# Teaching sequence

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 1:** What do we know about wetlands?

**Duration:** 50 minutes

**Lesson objectives**Students will:

identify what they know and want to know about wetlands.

Suggested learning sequence

**Introduction** – What do we know about wetlands?

1. Discuss with students what they already know about wetlands. Record student responses in the T of a TWLH chart (or K or a KWL chart). 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? *(You might use Google Earth or Maps to view satellite images of local wetlands)*

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?

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

**Activity** – What do we want to know about wetlands?

1. View images of wetlands. Discuss with students what they can see in the images. Encourage students to ask questions about what they see.
2. Record these questions in the W of the TWLH (or KWL) chart. These questions could be organised into specific topic areas of wetlands – plants, animals, water, people etc. Ensure you refer back and answer these questions as you progress through the unit.
3. **Optional activity:** Create a class concept map about wetlands using known information. Give students specific words from their current knowledge to begin the concept map. Use phrases to link the words together in the concept map. This can be added to during or at the end of the unit.
4. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
5. Have students start a science journal to record their learning and reflections after each science lesson. (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections). 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.

 Science journal

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. The science journal can be used as a part of student assessment.

Opportunities to monitor student learning

**Diagnostic assessment opportunities:**

Observations of students' responses during discussion

Observations of student participation during construction of concept map (if done)

Students could produce their own TWLH chart in their science journal for a concrete record of their prior knowledge

Resources

Useful web links

Suggested websites for images of wetlands:

<http://www.gbrmpa.gov.au>

<http://www.wetlandcare.com.au>

<http://wli.wwt.org.uk/>

<https://www.environment.gov.au/cgi-bin/wetlands/alphablist.pl>

<http://www.wetlandinfo.derm.qld.gov.au>

<http://www.ramsar.org/gallery>

Great Barrier Reef Outlook Report 2014

Access the report at: <http://elibrary.gbrmpa.gov.au/jspui/handle/11017/2855>

Useful information for this lesson can be found on:

page 60 - 61 and figure 3.12: Changes in terrestrial habitats

page 67: Terrestrial habitats that support the Great Barrier Reef

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 2 and 3:** What is a wetland?

**Duration:** 1 hour 40 minutes

**Lesson objectives**Students will:

identify and categorise the main types of wetlands and investigate how wetlands filter water

Suggested learning sequence

**Introduction** – What is a wetland?

1. Read the Wetlands Reef Beat 2006 poster 1 ‘What is a wetland?’ together.
2. In pairs, have students focus on the first two paragraphs – ‘What is a wetland?’ and ‘Types of wetlands’ – to help them identify specific wetland types in their local area.
3. Have pairs share their ideas with the class, identifying what information in the paragraphs informs them that their chosen local area is a wetland. (This information could be kept for the optional extra activity in Lesson 5).
4. Display the Reef Beat poster and begin an information tree diagram showing a classification of types of wetlands. (See *Resource 3 – Information tree diagram of wetlands* as one example).

**Note:** This tree diagram could be done on cards to rearrange and add paragraphs of information about each wetland area 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.

**Activity –** What do wetlands do?

1. Read the ‘Role of wetlands’ paragraph on the Wetlands Reef Beat 2006 poster 1 ‘What is a wetland?’, and add difficult words to the word wall. Discuss what students think this means for their identified local wetlands.
2. Explain to the students they are going to do an experiment to investigate how wetlands filter water. They will test different sediments in water flowing through different filter types.

**Note:** If time is not available, this experiment could become a class demonstration.

1. Explain to students that the items used to filter the sediment in the water are acting as the wetland. (Try to find a variety of filter materials that will have different sized filtration and absorption abilities for this experiment).
2. As a class view *Resource 4 – Wetlands filter experiment*. Discuss all the types of ‘sediments’ and ‘filters’. Discuss what variables students should control so they can compare their observations. Discuss the type of observations students can record in the table provided.
3. Once the investigation has finished, ask student groups to share their observations and as a class, compare and contrast results.
4. Discuss and have students brainstorm in their journal what the importance is behind wetlands filtering the water.
5. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
6. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections.

Opportunities to monitor student learning

**Formative assessment opportunities:**

Observations of student responses during introduction activity.

Students’ discussions and results table can be used as a record of their science inquiry skills.

Resources

Useful web links

Reef Beat 2006 Wetlands (Poster 1 – ‘What is a wetland’) at:  
[http://www.gbrmpa.gov.au](http://www.gbrmpa.gov.au/)

Wetland definition and classifications at:  
<http://wetlandinfo.ehp.qld.gov.au/wetlands/what-are-wetlands/definitions-classification/>

About Wetlands:  
<http://www.environment.gov.au/water/wetlands/about>

Fact sheet on types of wetlands (classified by ecological system):  
<http://www.wetlandcare.com.au/index.php/info-and-links/wca-publications/types-of-wetlands/>

Queensland's wonderful wetlands poster/brochure:  
<http://wetlandinfo.ehp.qld.gov.au/resources/static/pdf/resources/brochures-posters/qwp-qld-wonderful-wetlands-brochure.pdf>

Great Barrier Reef Outlook Report 2014

Access the report at: <http://elibrary.gbrmpa.gov.au/jspui/handle/11017/2855>

Useful information for this lesson can be found on:

page 18 and figure 2.3: Major habitats of the GBR region

page 60 - 61 and figure 3.12: Changes in terrestrial habitats

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

*Resource 3 – Information tree diagram of wetlands*

*Resource 4 – Wetlands filter experiment*

Other resources

Equipment for the experiment listed in *Resource 4 – Wetlands filter experiment*

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 4 and 5:** How does water flow through wetlands?

**Duration:** 1 hour 40 minutes

**Lesson objectives**Students will:

identify how water moves through the stages of the water cycle

examine how water flows through wetlands as part of the water cycle.

Suggested learning sequence

**Introduction** – Water cycle

**Note:** If students have enough experience with the water cycle, you may choose to skip this lesson.

1. Explore or review the water cycle using the Water Cycle Poster or the Total Water Cycle Management Poster (depending on students’ prior knowledge of the water cycle) from the Department of Environment and Resource Management Water Wise Program (See ‘**useful web sites’** for links).
2. 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 and 3 to identify where the wetlands are on the Water Cycle Poster. Identify the wetlands as freshwater or saltwater wetlands.

**Activity –** Water flow through wetlands

1. 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 in water 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 or materials of differing texture and absorbency to act as wetlands. Use twigs or toys to represent animals and plants.
* Use a sandpit and sandpit toys to create a larger scale model.

1. Take photos of catchment models as they are being built during the flood, drought and pollution events. These photos could be used for extra activities (see formative assessment opportunities for this lesson), or to make a book about the water cycle as an extra literacy activity.
2. Students can draw a diagram of their completed model to help cement their understanding of the water cycle.
3. 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 by too much water and the lack of water?
4. Discuss and make a conclusion about how far the dye travels when it is introduced into the water cycle. Who or what is affected by the pollution (dye)? Do the wetlands catch and filter some of the pollution?
5. Use knowledge from the wetland filter experiment or demonstration in Lesson 2 and 3 to discuss and draw conclusions about the importance of wetlands on filtering water as it enters the ocean.
6. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
7. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections).

Opportunities to monitor student learning

**Formative assessment opportunities:**

Observations of student responses during discussions.

Photographic record of catchment models built. Students 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.

Resources

Useful web links

Waterwise education resources: Water Cycle Poster and Total Water Cycle Management poster (Waterwise) found here:  
<https://publications.qld.gov.au/dataset/waterwise-education-resources>

Or direct links here:

* Water Cycle Poster:  
  <https://publications.qld.gov.au/storage/f/2014-12-15T04%3A06%3A38.203Z/the-water-cycle-poster.pdf>
* Total Water cycle Management Poster:   
  <https://publications.qld.gov.au/storage/f/2014-12-15T04%3A07%3A39.016Z/total-water-cycle-management.pdf>

Healthy waterways – Flood resources  
<http://www.ehmp.org/HealthyWaterways/FloodInfo/FloodResources.aspx>

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

Other resources

Trays, clay or play dough (or sand), food colouring, cut up sponge, water etc. for wetland models

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 6:** What types of wetlands are there?

**Duration:** 50 minutes

**Lesson objectives**Students will:

investigate and describe different types of wetlands.

**Suggested learning sequence**

**Introduction** – Wetland diversity

1. As an introduction, watch the YouTube clip ‘Wetlands: Keeping our planet alive and well’ (See **‘useful web sites’** for the link). Discuss the different wetlands seen, how they are connected across the landscape and why they are important. Discuss with students whether the local area has any of these types of wetlands.
2. As a class, read Reef Beat Poster 2 ‘Wetland diversity’ (2006). Add new words to the word wall and discuss what some of the similarities and differences are between the types of wetlands.

**Activity –** Mini information reports

1. Individually or in pairs, have students create a small PowerPoint presentation or a mini information report on a specific type of a wetland e.g. salt marsh, mudflats, billabongs, rivers, lakes and dams etc.
2. Have information posters e.g. Reef Beat 2006 Poster 2 ‘Wetland diversity’, books and Internet research available for students to access.
3. Key focus questions may also help students to write their PowerPoint presentation or mini information report. For example:

Describe your wetland type/what are its features?

Find a photograph of your wetland type.

Give examples of where this wetland type can be found either locally, in Queensland or in Australia.

What living things can be found at your wetland type?

Find some interesting/unusual facts about your wetland type.

1. Students present their information report to the class and display/add to the wetlands information tree diagram and also vocabulary onto the word wall.
2. The collated reports or PowerPoint presentations can also be made into an information book/display on wetlands that could be used in other classes or placed in the library.

**OPTIONAL extra activity – Local wetlands**

1. 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 local wetlands into types and compare/discuss their decisions about how they classified the different wetlands and what made them choose those classifications.
2. Review with students the scientific vocabulary pertinent to this lesson. (See *Resource 1– word bank* for suggested terms).
3. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections).

Citizen science participation

Study aerial photographs of local mangroves or wetlands to see how they have changed over time

Opportunities to monitor student learning

**Formative assessment opportunities:**

Information reports could be used to assess extent of research skills, writing skills and contextual knowledge.

Resources

Useful web links

YouTube clip - Wetlands: Keeping our planet alive and well:  
<https://www.youtube.com/watch?v=wBdwGxo0_kA>

**Hint:** Access and pre-load YouTube clips before the lesson so that you can play them immediately for students when required.

Reef Beat 2006 Wetlands (Poster 2 – ‘Wetland diversity’) at  
[http://www.gbrmpa.gov.au](http://www.gbrmpa.gov.au/)

Fact sheet on types of wetlands that could be researched (classified by ecological system):  
<http://www.wetlandcare.com.au/index.php/info-and-links/wca-publications/types-of-wetlands/>

Great Barrier Reef Outlook Report 2014

Access the report at: <http://elibrary.gbrmpa.gov.au/jspui/handle/11017/2855>

Useful information for this lesson can be found on:

page 60 - 61 and figure 3.12: Changes in terrestrial habitats

page 18 – 20: Mangrove forests, seagrass meadows and coral reefs.

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 7 and 8:** Who lives in wetlands?

**Duration:** 1 hour 40 minutes

**Lesson objectives**Students will:

investigate animals that live in different types of wetlands

classify and group these animals at the class level.

Suggested learning sequence

**Introduction** – What different types of animals live in wetlands?

1. Have a range of posters/images available of different types of wetlands. They could be of any wetland, from puddles and storm water drains to creeks and lakes to estuaries and coral reefs. The images, if possible, should have some animals represented in them to help with this lesson.
2. Review wetland types by asking student pairs to identify and classify one of the wetlands they can see in these images and justify their answer to the class.
3. As a class, view the food web diagram from the GBRMPA Reef Beat 2006, poster 5 – ‘Aquatic Food Webs’ and use this as a stimulus for students to identify animals that live in wetlands.
4. Make a class list of animals that live in wetlands. Ask students to name other animals they know rely on wetlands for survival. Students may also identify animals from the pictures of wetlands displayed. This list should be quite extensive.
5. Split students into pairs and assign each pair a specific type of wetland. You may choose to focus on specific wetlands, such as from your images, or discuss with the students which wetlands they will focus on (perhaps use local examples here).
6. Ask each pair to use the class list of animals to help them 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 with each other. Have pairs briefly share their lists with the class.

**Note:** As some wetlands won’t have many animals, some pairs may be able to investigate two different types of wetlands.

**Activity** – Classifying animals in wetlands

1. When pairs have finished, explain that they are going to classify (group) their animals. Explain that scientists classify animals in different ways. There are six main classes – mammals, birds, fishes, reptiles, amphibians and invertebrates.
2. Provide each pair with a copy of *Resource 5 – Animal classification - classes.* Read through the resource together and think of more examples of animals for each class.
3. Give each student pair a large sheet of paper. On the paper, each group writes down their wetland type as the title.
4. Have six different coloured piles of paper cut into squares or sticky notes for students which will be used to classify their animals. Decide together which colour will represent each class of animal.
5. Student pairs then classify the animals they have listed for *their* wetland by writing the name of each animal on its own piece of coloured paper that matches its appropriate class.
6. Students then place/stick these pieces of coloured paper onto their large sheet of paper. Students can physically group animals that are in the same class together so they can visualise the main classes of animals that live in their wetland.
7. Do a gallery walk around the classroom to view all the sheets of paper or display the sheets and view them all grouped together.
8. Have students compare the classes of animals for each wetland type and identify similarities and differences between wetlands.
9. Keep these posters for use later in the food web lessons (lesson 10 and 11).

**OPTIONAL extra activity** – native versus pest animals

1. Have students discuss if the animals they have 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. (This concept is discussed further in Lesson 13 and 14 which looks at the invasive fish species tilapia).
2. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
3. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections.

Opportunities to monitor student learning

**Formative assessment opportunities:**

Use observations and records of what students have written in their science journal and posters to identify what they have learnt and remembered.

Resources

Useful web links

Reef Beat 2006 Wetlands (Poster 5 – ‘Aquatic Food Webs’) at  
<http://www.gbrmpa.gov.au>

Wild kids - Animals of fresh water habitats:  
<http://australianmuseum.net.au/wild-kids-animals-of-freshwater-habitats>

Fauna Wetland Indicator Species List:  
<http://wetlandinfo.ehp.qld.gov.au/wetlands/ecology/components/fauna/fauna-indicator-species-list.html>

Flora Wetland Indicator Species List:  
<http://wetlandinfo.ehp.qld.gov.au/wetlands/ecology/components/flora/flora-indicator-species-list.html>

Animal Classes – Animal classification (details and examples):  
<http://www.kidzone.ws/animals/animal_classes.htm>

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

*Resource 5 – Animal classification – classes*

Other resources

A range of images of different kinds of wetlands

Large sheets of paper

Coloured sticky notes or coloured paper cut up into squares – six different colours are needed

Pens

Blue-tac for coloured paper squares (if used)

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 9 and 10:** What is a food chain?

**Duration:** 1 hour 40 minutes

**Lesson objectives**Students will:

recognise and understand the steps in a food chain from a wetland

use a futures circle to record and understand the impacts of human activity on a food chain.

Suggested learning sequence

**Introduction** – What is a food chain?

1. As a class, revise the lists of wetland animals made in Lesson 7 and 8. Give the class an example of a food chain from a wetland e.g.:

Sun>algae>water invertebrates>small fish>water birds

1. 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 the next lessons on food webs (lesson 10 and 11).
2. 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.

**Activity** – Making food chains

1. Have students create food chains to hang in the classroom. Cut strips of paper approximately 5cm 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.
2. 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.
3. 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 this list of events for the next lesson on food webs (lesson 10 – 11).
4. Complete a Futures Circle with the class (see *Resource 6 – Futures Circles*) 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.

**OPTIONAL extra activity** – consolidate learning

1. Students may also engage in food chain interactive resources to consolidate learning (See ‘**useful website’** for ideas including a wetland food chain).
2. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
3. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections).

Opportunities to monitor student learning

**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.

Resources

Useful web links

Food chains - interactive learning object at Scootle:  
<http://www.scootle.edu.au/ec/viewing/L1144/index.html>

Food chain at Eco Kids. This interactive game also looks at what happens when an element is taken out of the food chain. Select the game ‘Chain reaction: build a food chain’ at the following site:  
<https://ecokids.ca/take-action/play-and-learn>

Great Barrier Reef Outlook Report 2014

Access the report at: <http://elibrary.gbrmpa.gov.au/jspui/handle/11017/2855>

Useful information for this lesson can be found on:

page 166: Impacts to different wetlands that can affect living things and therefore food chains

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

*Resource 6 – Futures circles*

Other resources

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

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 11 and 12:** What is a food web?

**Duration:** 1 hour 40 minutes

**Lesson objectives**Students will:

recognise and understand the parts of a food web from a wetland

use a futures circle to record and understand the impacts of human activity on a food web.

Suggested learning sequence

**Introduction** – What is a food web?

1. 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.
2. Watch the YouTube clip ‘Animals of the wetland’ as an introduction to wetland food webs: <https://www.youtube.com/watch?v=4nJgIBeux6Y>
3. 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.
4. Using the food chains written down in the introductory activity of lesson 9, as a class, draw a food web for a specific wetland.
5. Ask students to identify the four levels of the food web –

Source > producer > consumer > decomposer

1. 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.

**Activity** – Creating food webs

1. In pairs or groups, ask students to draw their own food web from a specific wetland using the lists of animals from the posters created in Lesson 7 and 8. Students may need to refer to books or the 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 7 and 8 are represented with a food web.
2. Allow time for students to share their food webs with the class, identifying the four levels of their food web.
3. Complete a futures circle with the class (see *Resource 6 – Futures circles*) and discuss the impacts of both natural and artificial events on food webs.
4. Add these events to the list made in the food chain lesson (Lesson 9) or start a list if necessary.
5. 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.
6. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
7. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections).

Opportunities to monitor student learning

**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.

Resources

Useful web links

YouTube clip ‘Animals of the wetland’:  
<https://www.youtube.com/watch?v=4nJgIBeux6Y>

**Hint:** Access and pre-load YouTube clips before the lesson so that you can play them immediately for students when required.

Reef Beat 2006 Wetlands (Poster 5 – ‘Aquatic Food Webs’) at:  
<http://www.gbrmpa.gov.au>

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

*Resource 6 – Futures circles*

Other resources

Books, internet access for students to research food webs

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 13 - 14:** What threatens the health of  
 wetlands?

**Duration:** 1 hour 40 minutes

**Lesson objectives**Students will:

understand the value and benefits of wetlands

investigate threats to wetlands and their impacts on wetland health

identify ways to manage wetland health.

Suggested learning sequence

**Introduction** – Wetland values

1. Watch the first **two** minutes of the video *Critters: Where they wriggle* asking students to listen out for and note down examples of how wetlands are important: <https://www.youtube.com/watch?v=AXDlhG-3lRg>
2. Have a class discussion about the different benefits and values of wetlands:

In what ways are wetlands important?

Why do wetlands need to be healthy?

What might be the consequences if wetlands were not healthy?

1. Break students up into groups and give each group one of the following GBRMPA Reef Beat 2006 posters:

6 - Wetland Values

7 - Cultural values of wetlands

8 - Disappearing wetlands

9 - Protecting wetlands in Queensland

10 - Doing our bit to look after it

1. Ask each group to read and create a dot point summary of their poster.
2. Get each group to share their summaries to the class and use these summaries to create a class chart listing ‘wetland benefits’, ‘threats to wetlands’ and ‘managing wetland health’.

**Activity** – investigating threats

1. View the following ABC Catalyst episode on Tilapia – the pest species that is a threat to wetland health:  
   <http://www.abc.net.au/catalyst/stories/4122587.htm>
2. Discuss as a class why tilapias are considered a pest and what their impacts are. (See **‘useful web links’** for information). Also use this as an opportunity to link back to the lessons on food chains and food webs by considering the potential impacts of tilapia to these interactions.
3. Complete a futures circle on the impacts of tilapia on wetlands and how they may be managed (See *Resource 6 – Futures circle*)
4. If time, have students independently complete futures circles on a different threat to wetlands e.g. rubbish.
5. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
6. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections).

Opportunities to monitor student learning

**Formative assessment opportunities:**

Students’ responses to discussion and poster summaries could be used to assess their science understandings.

Students’ future circles (if done) could be used to assess science as a human endeavour.

Resources

**Useful web links**

Critters: where they wiggle – a video about aquatic macro- invertebrates and how they help with monitoring water health:  
<https://www.youtube.com/watch?v=AXDlhG-3lRg>

**Hint:** Access and pre-load YouTube clips before the lesson so that you can play them immediately for students when required.

Reef Beat 2006 Wetlands (Poster 6 – 10) at:  
http://[www.gbrmpa.gov.au](http://www.gbrmpa.gov.au)

ABC Catalyst episode on Tilapia – the pest species that is a threat to wetland health:  
<http://www.abc.net.au/catalyst/stories/4122587.htm>

Information on Tilapia:

* <http://www.dpi.nsw.gov.au/fisheries/pests-diseases/freshwater-pests/species/tilapia>
* <http://www.pestsmart.org.au/pest-animal-species/tilapia/>
* or the information sheet at <http://www.pestsmart.org.au/pest-animal-species/tilapia/>

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

*Resource 6 – futures circle*

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 15:** How can we measure wetland health?

**Duration:** 50 minutes

**Lesson objectives**Students will:

understand how environmental conditions can affect the health of a wetland

understand the water quality indicators used to assess water health of a wetland

recognise how macro invertebrates can be used to indicate water health.

Suggested learning sequence

**Introduction** – waterway health

1. Step through the ‘water quality’ PowerPoint presentation at the following web site link and discuss with students how environmental conditions can affect the health of a wetland and how this can be monitored *(explore the presentation and notes and see what slides you might focus on):*<http://www.mdba.gov.au/education/teachers/lesson-plans>
2. Have students list in their science journals:

six things that can make a river unhealthy

six water quality indicators that can be measured.

**Activity** – health check for our waterway

**Note:** In this activity, students explore information on different water quality indicators and how to test for them. What information students explore will depend on what water testing kits or equipment you may have access to. (See ‘**Resources’** forexamples of a kit to purchase. For information on different water quality indicators see the teacher information packs at **‘Useful web links’**).

1. Explain to students why water quality tests are important and what they show about the health of a waterway.
2. Tell them they are going to become experts in testing water so they can train other class members.
3. Break students up into groups and provide each group with information and equipment about one water quality indicator. Examples may include:

temperature

pH

turbidity

salinity

dissolved oxygen

nitrate

phosphate.

1. Ask each group to read the information, explore the equipment and prepare a short oral ‘training’ presentation back to the class about the indicator and how to test for it.
2. Come together and have groups share their ‘training’ presentations. Ask the groups questions and consolidate understanding.
3. Students watch the segment [2:00–4:35 minutes] of the video *Critters: Where they wriggle* which introduces the different macro invertebrates found in waterways:  
   <https://www.youtube.com/watch?v=AXDlhG-3lRg>
4. Provide student groups with *the ‘Junior macro invertebrate ID chart’* (See ‘**useful web links’** for the link).
5. Review the pollution sensitivity key for macro invertebrates and ask students to explain what this means in terms of wetland health.

**Optional activity:** Discuss how the macro invertebrates have been grouped in the chart. Can students classify them in other ways? Have students cut out the images and physically group them onto a big piece of paper using their own classification criteria. Have a gallery walk and discuss students’ choices.

1. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
2. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections).

Opportunities to monitor student learning

**Formative assessment opportunities:**

Students’ responses to discussion questions and journal entries could be used to assess their science understandings.

Resources

Useful web links

Water quality presentation (select the ‘water quality’ link) includes a PowerPoint presentation with notes, teacher notes and student handouts.  
<http://www.mdba.gov.au/education/teachers/lesson-plans>

Critters: where they wiggle – a video about aquatic macro-invertebrates and how they help with monitoring water health:  
<https://www.youtube.com/watch?v=AXDlhG-3lRg>

School monitoring. Select the link ‘Freshwater quality teacher information pack’ under the heading ‘Freshwater quality’. An extensive resource that includes steps for different water quality tests:  
<http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/about-us/our-regions-progress/monitoring-and-evaluation/schools>

Waterwatch Australia national technical manual: module 4 – physical and chemical parameters. A comprehensive guide to water quality testing. Language is quite complex however this provides detailed background information if preparing for an excursion or if creating your own support materials:  
<http://nrmonline.nrm.gov.au/catalog/mql:2880>

Macro invertebrate ID chart: Select ‘Junior Macro invertebrate ID chart’ under the heading ‘Macro invertebrates’. There are many other related resources and teacher information packs under this heading that can be useful when completing excursions with students:  
<http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/about-us/our-regions-progress/monitoring-and-evaluation/schools>

The USGS Water Science School – Water Quality - information on water quality tests (USA):  
<http://water.usgs.gov/edu/waterquality.html>

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

Resources continued

Other resources

Water testing kit:

*Earth force low cost water testing kit* includes 10 tests for pH, dissolved oxygen, biochemical oxygen demand, temperature, turbidity, nitrate, phosphate, and coliform bacteria. The kit also includes a manual with step-by-step guidelines. Replacements chemicals can also be purchased for this kit. Available at:  
<http://www.testkits.com.au/green-low-cost-water-testing-kit/>

Paper and pens (for optional macro invertebrate classification activity)

Scissors and glue (for optional macro invertebrate classification activity)

Reference:

Lesson 15: *How can we measure wetland health?* was adapted from ‘Investigating our local waterway – for years 6 and 7’, Australian Water Association at  
<http://www.awa.asn.au/AWA_MBRR/Publications/Teacher_Resources/Investigating_our_local_waterway_Years_6_7.aspx>

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 16 - 18:** Excursion to a wetland

**Duration:** See below\*

**Lesson objectives**Students will:

investigate wetlands and examine water quality

analyse data and observations and draw conclusions on wetland health

explain what wetland management strategies can be implemented to keep wetlands healthy.

\* Duration

The suggested time for an excursion will depend on where the wetland is and how long the class spends at the wetland. You may also decide that a number of visits are necessary.

Excursion aims

The aim of the excursion is for students to gain real life experience diagnosing the health of a wetland and thinking about the proper management of wetlands to keep them healthy.

Alternative to excursion

View the section ‘Excursion alternatives’ for ideas if it is not possible or there is not enough time to go on an excursion to a wetland.

Animal ethics

Ensure students follow The Animal Care and Protection Act 2001 and The Australian Code of Practice for the Care and Use of Animals for Scientific Purposes, 2013, 8th Edition in accordance with Education Queensland Guidelines if engaging with living things on an excursion. See <http://education.qld.gov.au/curriculum/area/science/animals-ed.html> for more information.

Suggested activities at the wetland

Activities completed at the wetland will depend on the time available, wetland visited, resources available, student expectations and teacher expectations. (See **‘Useful web links’** for resources, data sheets and steps to support water health surveys and excursions to wetlands).

Consider students completing a science report after the excursion to analyse data and observations collected and answer guided questions about wetland health and its management.

Examples of activities during and after the excursion include:

Sketch the site. Where does your wetland fit into the landscape?

What are the adjacent land uses around your wetland? Is it being impacted from these uses?

Where does the water come from to nourish your wetland? Is this source natural or artificial (e.g. stormwater)?

Survey the animals seen at the wetland (take notes on food chains and food webs).

If the wetland is in poor health, look at ways the school or class could be involved in its rehabilitation.

If the wetland is healthy, look at reasons why it is healthy and ways the school could be involved to maintain the wetland.

Photograph the wetland to use in the creation of a book about wetlands.

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 helps to look after the local wetlands
* an Indigenous representative who would have information regarding 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.

Excursion alternatives

If it is not possible, or if there is not enough time to go on an excursion to a wetland, consider the following alternatives:

Invite visitors to come to the school to discuss local wetland health and management. Request they bring images or information that can be displayed in the class. Have students generate questions to interview the visitors. Visitors could include:

a local council representative

a local scientist

a person from a local organisation that 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.

Ask students to design an investigation to compare the quality of water at two different locations using what they have learnt in lesson time.

Do the experiment in the ‘water testing lesson’ or the ‘Extension Activities’ as described in the *‘Freshwater teacher information pack’*. This is found under the heading ‘Freshwater quality’ at:  
<http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/about-us/our-regions-progress/monitoring-and-evaluation/schools>

Do the optional lesson described next in this unit: Can you create a wetland?

Citizen science participation

Provide your results of wetland health to the local council or NRM e.g. via <http://www.nrm.gov.au/regional/regional-nrm-organisations>

Opportunities to monitor student learning

**Formative assessment opportunities:**

Student participation in collecting data, questioning and proposing ideas can be used to assess their science inquiry skills.

Student excursion reports can be used to assess students’ knowledge and understanding of science understandings, science as a human endeavour and science inquiry skills.

Resources

Water testing kit

*Earth force low cost water testing kit* includes 10 tests for pH, dissolved oxygen, biochemical oxygen demand, temperature, turbidity, nitrate, phosphate, and coliform bacteria. The kit also includes a manual with step-by-step guidelines. Replacements chemicals can also be purchased for this kit. Available at:  
<http://www.testkits.com.au/green-low-cost-water-testing-kit/>

Useful web links

A learning sequence for investigating a local waterway with associated resources e.g. data sheets.  
<http://www.awa.asn.au/AWA_MBRR/Publications/Teacher_Resources/Investigating_our_local_waterway_Years_6_7.aspx>

School monitoring. Select the link *‘Freshwater quality teacher information pack’* under the heading ‘Freshwater quality’. An extensive resource that includes steps for different water quality tests, data sheets and suggestions for an excursion:  
<http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/about-us/our-regions-progress/monitoring-and-evaluation/schools>

Waterwatch Australia national technical manual: module 4 – physical and chemical parameters. A comprehensive guide to water quality testing. Language is quite complex however this provides detailed background information if preparing for an excursion:  
<http://nrmonline.nrm.gov.au/catalog/mql:2880>

A waterways health check: rating your local waterway. A process for rating a local waterway:  
<http://nrmonline.nrm.gov.au/catalog/mql:2879>

Waterwatch. Select ‘Junior Waterwatch teacher’s guide’ and ‘field manual’ at:  
<http://www.environment.nsw.gov.au/waterwatch/getPublications.htm>

Macro invertebrate ID chart: Select *‘Junior Macro-invertebrate ID chart’* under the heading ‘Macro invertebrates’. View the other resources that are useful for excursions:   
<http://www.naturalresources.sa.gov.au/adelaidemtloftyranges/about-us/our-regions-progress/monitoring-and-evaluation/schools>

Streamwatch water bug guide (more comprehensive macro-invertebrate ID):  
<http://australianmuseum.net.au/document/streamwatch-water-bug-guide>

Engage

Explore

Explain

Elaborate

Evaluate

**Optional Lesson:** Can you create a wetland?

**Duration:** 1 hour 40 minutes

**Lesson objectives**Students will:

research and create a model of a wetland

describe the parts of the wetland, including living things and food webs

describe impacts on the health of the wetland by humans and natural events.

Suggested learning sequence

**Note:** The duration of this lesson will depend on 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 KLAs such as arts and mathematics if time permits.

**Introduction** – Review

1. Do a walkthrough of information already gathered on wetlands – TWLH chart, concept maps, word wall, information tree diagram, Reef Beat posters, student presentations on wetlands, food chains and webs and science journals. Encourage students to comment on their learning or add information to the displays they may think important.
2. Read the GBRMPA Reef Beat 2006, poster 4 – ‘It’s all connected’.
3. Discuss the water flow – from source to sea. As a class, draw a rough sketch of a local waterway – from source to sea.

**Activity** – 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 a 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.

Label parts – groups should discuss and prepare labels for the different parts of each wetland.

Students should also represent a food web in their wetland.

**If drawing a wetland**

This can be done individually or in pairs.

Assign each student, or pair of students, a wetland.

Students will need to investigate their wetland via books, posters 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 understand what a cross section drawing should look like.

**Activity** – Presentation of wetland

1. When students have finished their construction or drawing of a wetland, they present it to the class and answer some questions. The following questions are examples:

What sort of wetland is it? Where could it be located within the Australian environment?

What is an example of a food web in your wetland?

What are the differences and similarities between your wetland and others you have observed?

Where will the water flow in and out of the wetlands? E.g. across the land, rivers and creeks, groundwater.

Does the weather affect this? What will happen in extreme weather?

How might land use such as urban development affect the wetland?

How might land use such as farming affect the wetland?

How can land use be managed to minimise its impacts on the wetland?

1. Review with students the scientific vocabulary pertinent to this lesson (See *Resource 1– Word bank* for suggested terms).
2. Students add their learning and reflections to their science journal (See *Resource 2 – Student reflections* for examples of sentence starters you can use to guide student reflections).

Opportunities to monitor student learning

**Formative 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 science as a human endeavour.

Resources

**Useful web links**

Reef Beat 2006 Wetlands (poster 4 – ‘It’s all connected’ and poster 5 – ‘Aquatic Food Webs’) at:  
<http://www.gbrmpa.gov.au/resources-and-publications/student-and-teacher-resources/reef-beat-series>

WetlandInfo – Pictorial conceptual models. Examples and information at:  
<http://wetlandinfo.ehp.qld.gov.au/wetlands/resources/pictorial-conceptual-models.html>

OzCoasts – Australian Online Coastal Information– Building a conceptual model at:  
<http://www.ozcoasts.gov.au/conceptual_mods/cm_build.jsp>

Printable resources

*Resource 1 – Word bank*

*Resource 2 – Student reflections*

Other resources

Resources for building or drawing wetlands

Engage

Explore

Explain

Elaborate

Evaluate

**Lesson 19 - 21:** Reflections andassessment task

**Duration:** 2 hours 30 minutes

Suggested learning sequence

**Introduction –** reflections and task introduction

1. As a class, reflect and record what has been learned in the original TWLH chart.
2. Explain to the students that they are going to begin their final assessment report. Present them with the task sheet and the Guide for making judgements *(Resource 7 – Student task sheet and Guide for making judgements).*
3. Read through the task sheet and Guide for making judgements together and identify all the requirements of the task.
4. Discuss available resources (identify all the work done throughout the unit that will help the students complete the task).
5. Set out a plan for time management and resource management.

**Activity –** Prepare reports

1. Allow students time to research and prepare their report.
2. Students may need scaffolding for different parts of the report; this will depend on the needs of the class.
3. How much time students are able to spend preparing their report will depend on the needs of the class and the length of time available in the school term.

Opportunities to monitor student learning

**Summative assessment opportunities:**

Student presentations can be used to assess students’ knowledge and understanding of science understandings, science as a human endeavour and science inquiry skills.

Resources

Printable resources

*Resource 7 – Student task sheet and Guide for making judgements*

Other resources

Class displays and posters

Posters, books

Access to the Internet

Resources

Resource 1 – Word bank

| Wetland | Brackish | Estuarine | Aquatic |
| --- | --- | --- | --- |
| Marine | Freshwater | Billabong | Swamp |
| Creek | Salt marsh | Mangroves | Mudflats |
| Catchment | Filter | Sediment | Pollution |
| Erosion | Seagrass | RAMSAR sites | Classification |
| Flood | Drought | Class (for animal classification) | Mammals |
| Birds | Fish | Reptiles | Amphibians |
| Invertebrates | Native | Pest | Invasive |
| Flora | Fauna | Food chain | Natural |
| Artificial | Food web | Producer | Consumer |
| Decomposer | Management | Turbidity | Dissolved oxygen |
| Macro-invertebrates | Pollution sensitivity |  |  |

Resource 2 – Student reflections

Consider displaying sentence starters or questions such as below in the classroom. Alternatively they could be turned into laminated thought bubbles that are passed to students directly. Students could choose two or three thoughts to complete in their journal then share their responses with the class.

| End of lesson reflections | | | Guiding students to reflect on their own thinking | | |
| --- | --- | --- | --- | --- | --- |
| Today I discovered …  I want to know more about …  Something new I found out was …  I am excited about …  Something I am finding interesting is …  The most challenging thing was … | | I am most proud of …  I feel confident about …  I am enjoying … because …  I am confused by …  Today I asked …  A question I have is … | I am starting to think differently about …  I got stuck when … and I got back on track by …  I figured out that …  I solved a problem by …  I first thought … but then I realised that … | This idea is useful for …  Some things I didn’t understand are …  To help me understand better I will …  Before I didn’t know …  Now I realise/know … | |
| Reflecting on stewardship and taking action | | | End of unit reflections – where I was and where I am now | | |
| This information can make a difference by …  It is important to know about this because …  Something I will now do as a result of my learning is …  Something I want to do next is … | Something I will now help others understand is …  I can make a difference by …  An action I/we can take is …  If we don’t … the consequences could be …  It is important to … because … | | I used to think …  Now I know …  This causes me to (re)think/ wonder … | | * **Revisit** your first journal entry. What do you understand now that you didn’t back then? * **Review** your work so far. What has been the biggest discovery/learning/challenge? * **Reconsider** your initial ideas. Have your ideas changed? If so how? |
| 1. I didn’t know how to … 2. Now I can … 3. In the future I will … | |

Resource 3 – Information tree diagram of wetlands

*Example of an information display students can add to as they gain more complex knowledge of wetlands. You may choose a different classification system for wetland types such as by ecological system e.g. at* <http://www.wetlandcare.com.au/index.php/info-and-links/wca-publications/types-of-wetlands/>  
*The information in this information tree will be utilised as a part of the students’ final assessment piece.*

**Wetlands**

**Freshwater**

**Saltwater**

**Swamp**

Swamps are found …

Swamps provide food and shelter for …

An example of a food chain in a swamp is …

A water quality issue found in swamps is …

Water quality issues cause …

An effective solution to the issues is …

**Ponds**

**Mangroves**

**Coral reef**

Resource 4 – Wetlands filter experiment

| Aim |
| --- |
| To find out what wetlands do |
| Equipment per group |
| * Water * Items to be washed into the wetland (sediment) e.g. 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 * Container e.g. a large mixing bowl, bucket or jar with a lid to mix water and chosen sediment together * A sink or tray to catch the water |
| Procedure |
| 1. Line illustration - wetlands creaturesChoose your first sediment type and filter type and add this to the first row of your results table. 2. Mix the sediment type with water in your container. Think about how to keep this a fair test. What will need to be kept the same? 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 your observations in the results table. In your observations, record what sediment was caught by the filter and what was not. 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, make an observation about how much is in the filter and how much is in the sink. 5. Repeat the investigation for a different type of sediment and a different type of filter. 6. Record all your observations in the results table. |

Results table

| Type of filter and type of sediment | Observations |
| --- | --- |
|  |  |
|  |  |
|  |  |
|  |  |

Resource 5 – Animal classification – Classes

*(Information collected from a range of Internet resources - Science Castle* <http://www.sciencecastle.com>*, Shape of life* <http://shapeoflife.org/> *and Middle School Science* <http://www.middleschoolscience.com>*)*

| Mammals | Birds | Fishes |
| --- | --- | --- |
| 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  Line illustration - dugong | Birds hatch out of a hard shelled egg 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  Line illustration - ibis | 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  Line illustration - humbug fish |
| Reptiles | Amphibians | Invertebrates |
| 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  Line illustration - sea turtle | 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.  Line illustration - toad | 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  Line illustration - crab |

Resource 6 – Future circles

*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.*

**N**atural impacts

**S**ocial impacts

**E**conomic impacts

**W**ho did it?

**W**ho will fix it?

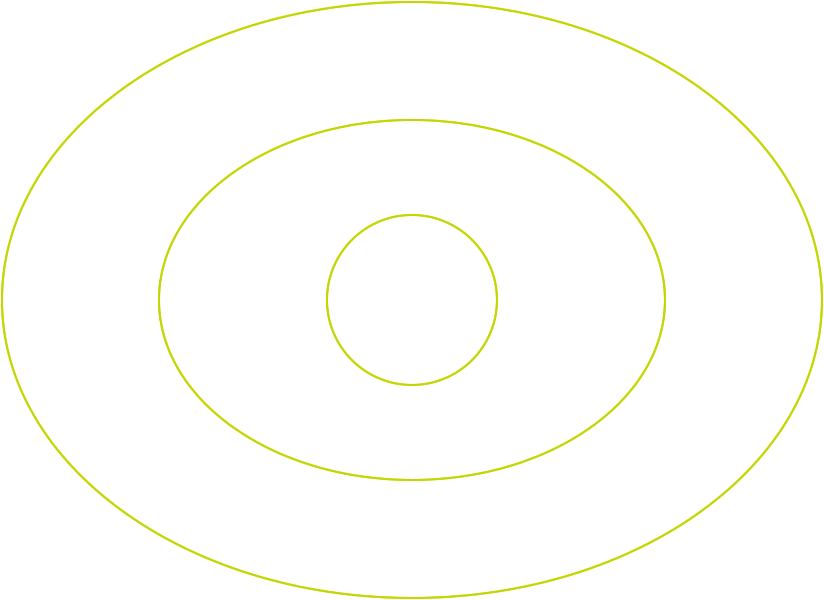
**EVENT**

**IMMEDIATE EFFECT**

An immediate result of the event

**SHORT AND LONG TERM EFFECTS**

Things that happen more slowly over time due to the immediate impacts



Resource 7 – Student task sheet and Guide for making judgements

### Wetlands – Year 7 science report

### Your task:

You are required to prepare a scientific report on wetlands.

**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 drawn poster of each wetland. Each poster will include:

a labelled cross section of the wetland

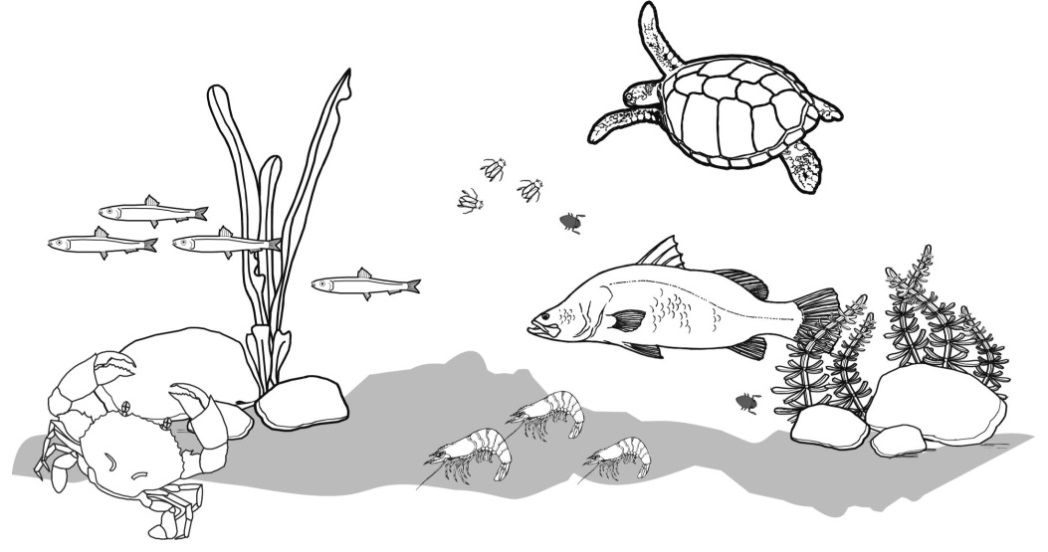
a labelled diagram showing how the wetland fits into the water cycle and why it is important

a food web found within the wetland and a description of the interactions between living things.

Describe the threats to the ‘under threat’ wetland and explain why each threat causes the wetland to become unhealthy.

Use scientific understanding to identify and explain solutions to each of the threats you have identified.

For each solution you have identified, describe how it might influence human activities e.g. changes to behaviours and management practises.

**When preparing 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

be confident.

|  |  |
| --- | --- |
| Year 7 Science: Wetlands science report | Name: |

**Purpose:** To describe and draw a pristine wetland and a wetland under threat. To visually represent how each wetland fits into the water cycle and explain why the wetland is important. To draw a food web for each wetland and describe the interactions between the living things. To describe and explain threats and solutions to the wetland ‘under threat’ and explain how solutions might influence human activities and management practises.

Explains how relationships with other living things and the [environment](http://www.australiancurriculum.edu.au/glossary/popup?a=S&t=Environment) assist or hinder its survival

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Science Understanding | | | | Science as a Human Endeavour | | Science Inquiry Skills | |  |
| Biological sciences | | Earth and space sciences | | Use and influence of science | | Communicating | |
| Draws a food web for each wetland and describes the interactions between the living things | | Visually represents how each wetland fits into the water cycle and explains why the wetland is important | | Describes and explains threats and solutions to the wetland ‘under threat’ and explain how solutions might influence human activities and management practises | | Communicate ideas using scientific language and representations | |  |
|  | * Integrates food web descriptions with scientific knowledge |  | * Integrates water cycle and explanations with scientific knowledge |  | * Descriptions are thorough and explanations are justified |  | * Communicates ideas concisely | A |
| * Links food web descriptions with scientific knowledge | * Links water cycle and explanations with scientific knowledge | * Descriptions and explanations are informed | * Communicates ideas coherently using appropriate scientific terminology throughout | B |
| * Draws a food web for each wetland and describes the interactions between the living things | * Visually represents how each wetland fits into the water cycle and explains why the wetland is important | * Describes and explains threats and solutions to the wetland ‘under threat’ and explain how solutions might influence human activities and management practises | * Communicate ideas using scientific language and representations | C |
| * Partially draws a food web for each wetland and partially describes the interactions between the living things | * Partially represents how each wetland fits into the water cycle and partially explains why the wetland is important | * Identifies threats and solutions to the wetland ‘under threat’ and describes how solutions might influence human activities and management practises | * Communicates ideas using everyday language | D |
| * Recalls some interactions between living things | * Recalls some parts of the water cycle and facts about wetlands | * Statements about threats and solutions to the wetland | * Fragmented communication of ideas | E |
| Teacher feedback: | | | | | | | | |