

1. INTRODUCTION

1.1 Main idea

This unit introduces students to the issues concerned with promoting sustainable wildlife industries such as whale watching by discussing the benefits of non-consumptive use and the rules that apply across a range of whale watching-related scenarios. Working with the resources available, students will explore information related to the annual whale migration patterns of Australian whales and how this drives the whale watching tourism industry. In doing so, students are provided with the opportunity to make the connection between the importance of, supporting the conservation and protection of whales and dolphins, and how this benefits and impacts upon the general public and the whale watching industry. Students are encouraged to seek out opportunities to experience their own sightings.

Unit 1	Unique features of whales and dolphins. This introductory unit of work enables students to investigate the anatomy, communication, feeding and migratory habits of whales and dolphins.
Unit 2	Whale & dolphin conservation and protection. This unit enables students to learn about the history of whaling, current conservation and protection rules and the agencies responsible. It addresses issues such as the types of research conducted in various countries and the concerns and actions taken by the international community to promote the conservation and recovery of whales and dolphins.
Unit 3	Whale watching. This unit enables students to investigate information regarding rules and regulations applied to the practice of whale watching. It provides opportunities for students to explore the benefits and impacts that whale watching as a tourism industry has upon these marine mammals.

1.2 Key understandings

- Whale watching is becoming more and more popular as people become more interested in (and concerned about) whales and dolphins.
- There are many benefits to be gained from whale watching. These include increased public awareness and support for the conservation and protection of whales and dolphins (biodiversity/ecological), an increase in local and national tourism activities (economic), individual experiences that “make it real” for people, encouraging them to explore ways they can help save our whales (habitat/water pollution).
- A number of rules have been set up to continue to reduce impacts on our whales and dolphins when whale watching from land or when at sea.
- When whale watching at sea, specific distances must be kept between whales and dolphins and people or their craft (boats, planes, swimming).
- Sightings of whales seen during whale watching activities can be reported online to an appropriate government department (Department of the Environment and Water Resources website, details are provided within the “Laptop” in Research Centre). By recording each sighting, this information helps us to understand the migration patterns of our whale and dolphin species throughout the year.
- As individuals, our actions count. We can all contribute towards the goal of making sure the conservation and protection of whales and dolphins is continued, especially during whale watching activities.

1.3 Focus questions

- What is whale watching?
- Where does whale watching happen?
- What is the pattern and distribution of whales in these areas?
- How and why do the whales come to these areas?
- What effect does whale and dolphin watching have on whales and dolphins?
- What are some of the social, economic, political and physical impacts of current and possible future whale watching activity?
- What consequences might arise as a result of these changes?
- What is being done by individuals, groups and governments regarding the sustainable management of whales and dolphins?
- What else could be done?
- What steps can be taken to ensure that whales and dolphins are protected during whale watching activities?
- In what ways does whale watching contribute towards the overall conservation and protection of whales and dolphins?

Key terms

biodiversity, conservation, degrade, ecological, economic, habitat, promotional, migratory patterns, protection, regulations, rules

Key Learning Areas (KLAs)

- Studies of Society and Environment (SOSE)/Human Society and Its Environment (HSIE)
- Science & Technology
- Maths
- English
- Visual Arts

2. SAMPLE LEARNING AND TEACHING SEQUENCE - TUNING IN

2.1 What do we know about whale watching?

Pose questions to the class such as:

- Q Who has had a whale watching experience? Was it planned or unexpected? Where did it happen? What time of year was it?
- Q How is whale watching is carried out? From where does whale watching occur? Can anyone go whale watching?
- Q Are there any rules involved in whale watching? If so, what are they?
- Q What effect does the whale watching industry have on our whales and dolphins? Should it be allowed to continue?

Facilitate a whole-class discussion. Capture student responses, asking students to draw and record comments offered by the class, arranging this in a manner that is suitable (i.e. using a brainstorm diagram, listing). Retain this chart as a reference tool to display at the end of the unit to illustrate how student understanding about this issue has deepened and expanded throughout the unit and the overall topic.

3. PREPARING TO FIND OUT

As a class, discuss student responses to the following questions:

- Q What are the advantages of whale watching for both humans and our whales and dolphins?
- Q What are the disadvantages of whale watching for both humans and our whales and dolphins?
- Q In what ways does whale watching as an industry contribute towards the conservation and protection of whales and dolphins?

Debrief:

- Using flip chart paper, create a separate sheet for each of the questions, using the questions as a heading for each sheet.
- Nominate a couple of students to act as scribe and record student responses, listing each of the comments as offered by students.
- Store these sheets for display and future reference further on within this unit and overall topic.

3.1 Setting the inquiry

The following list offers a suggestion of tasks for students once they have completed their research within the *finding out* and *sorting out* stages of inquiry. Explain to students that the research activities they are about to undertake will equip them with the information they need to complete the following tasks:

For upper-level students (Yr 6-8)

- Whole-class project – establishment of a whale watching company. Working as a whole class and then in small groups, students will undertake a range of tasks to establish a new company in the whale watching tourism industry. When groups are formed, ask students to consider and identify each of the tasks involved in setting up a whale watching company. Students will then be asked to produce a suite of promotional materials to be used at the company launch. The materials could include the following: (1) A mission statement outlining the goals of the company (why it was established and what it aims to achieve), (2) advertising materials (such as posters, business cards, brochures for the public, etc) promoting the company's whale watching activities.

In order for students to successfully complete this task they will need to (A) work together to identify how they will approach and complete the overall task (problem solving, talking and listening, identifying environmental issues, planning, gathering information), and (B) produce the actual promotional items required for the company launch (sorting and arranging information, designing and making, writing persuasive texts, spoken presentations).

Ask students to consider a range of issues as they prepare to form their company. Items for consideration may include:

- Q What do they want the company to achieve? What will they name the company?
- Q What whale watching activities will the company offer? How are these different from what the other whale watching companies are offering?
- Q Are there any rules and guidelines that need to be followed?
- Q What roles are required to run the company? Where should the office be located?

Theme 3: Whale Watching

- Q Where will the money required to run the company come from? How much will the company charge for the tours?
- Q What sort of educational material or information will the company offer to its customers?

For mid/upper-level primary students through to middle school (Yr 5 & 6 and 7-8)

- Hold a debate. Ask students to research the issues relating to the following statements and conduct a debate. This would be performed both in class, then possibly at a whole school or community event. Divide students into groups of six (6), allocating the three (3) “for” and “against” students within each group. Assign the following statements (either randomly or selectively). Some students will have experience in debating; however others will require support as they plan and prepare for the debate (such as structure and approach, how to present and participate in a debate).

Sample debate statements:

1. The whale watching industry in Australia has a positive impact upon our whales and dolphins.
 2. Whale watching activities are harmful to our whale and dolphin species.
 3. The regulations regarding the distances between people and whales and dolphins are too strict – they make whale watching activities too difficult.
- Design a board game. Working in small groups, ask students to design and make a board game that is based on whale watching (for example, a whale watching race around the Australian coastline). The game must be based on facts and include opportunities for those playing the game to learn about the whale watching opportunities in Australia as well as the rules, benefits and impact of whale watching on our whale and dolphin species. Once produced, student groups can swap and play these games and donate them to the school library for other classes to use.
 - Select, investigate and present a report on four (4) different whale watching companies. Depending on age and ability, students work individually, in pairs or groups of four to produce these reports. Ask students to present their findings by selecting an appropriate format that is suitable for the number of people in the group. For example, individuals may choose to write an information report, pairs might produce a poster, groups or 4 students may prepare a larger poster or create a multi-media presentation (which would enable the equitable division of effort and allow for independent work to occur prior to group reforming for the collation and production stages).

For each organisation selected, students gather, analyse and arrange the following information. Younger students may require support during the research stage (for example, location and arrangement of resources).

- Q What is the name of the whale watching company?
- Q What area along the coastline do they operate in? What times of year do they offer whale watching tours?
- Q Describe the whale watching activities offered by the company.
- Q Do the whale watching activities of this company effect the environment or the whales and dolphins as they're being watched?

For mid-level students (Yr 3-5)

- Prepare and deliver a presentation on the whale watching industry in Australia. Working in pairs, ask students to research, write and present an exposition-type report to present their view on the whale watching industry in Australia. Within the report, ask students to examine issues such as the different types of activities provided by companies within the industry, the pros and cons of the whale watching industry and how whale watching does (or does not) support the conservation and protection of whales and dolphins. Students are to include a closing statement that outlines their overall view on the whale watching industry, and if and how this could be improved to better support the conservation and protection of whales and dolphins.

The presentation may be created using PowerPoint or art materials. After students have delivered their presentations, facilitate a whole-class discussion as a way of supporting students to make connections between whale watching and the conservation and protection of whales and dolphins.

- Write a story about a whale or dolphin's experience with people who are whale watching. Ask students to write a story using a narrative structure to tell the story of a whale in today's environment, describing the interactions and experiences of the whale and those who are whale watchers. The story is to be handwritten and orally presented to the class or at a whole-school or community event.
- Design a holiday package for a whale watching touring holiday. Working in pairs, students are provided with the following scenario and task:
 - Students work for a travel agency and have been given the task of developing a new holiday package
 - The holiday package is to target people who want to go whale watching
 - The location(s) can be anywhere around the Australian coastline including the Antarctic region

Students research, plan and design the holiday itinerary (where, when, what to do) and produce a brochure to be used in the shop to promote the holiday package.

- Write a TV advertisement that promotes the rules that apply when watching whales and dolphins. Working in pairs, ask students to imagine they have been asked to write and produce an advertisement for TV to promote the rules about safe distances that must be kept between us and whales and dolphins. Ask students to present their advertisement to the class using role play. Each student is to share the various preparation and presentation tasks, which include: research, organising the information, preparing visual artworks/illustrations to support the information being presented, writing the script to be spoken during the role play, rehearsing and then performing the role play for the class or other audience.
- Create a whale watching calendar. Individual work. Students collect relevant illustrations and facts regarding whale watching locations and seasons and produce an illustrated calendar of whales and dolphins seen around Australia throughout the year.
- Create an illustrated listing of the whale and dolphin species that can be seen around Australia. Working in pairs or small groups, ask students to locate the information they need to produce an illustrated information report to represent the different types of whales and dolphins found in the Australian Whale Sanctuary. Students will select and use a suitable method to categorise, sort and display the data and images.

For lower-level students (Yr K-2)

- Add to an existing scrap book. Individual work. Students collect relevant illustrations and facts regarding whale watching and arrange them to create a visual representation of their learning within this unit.

This is a final stage of this activity as students add the final chapter of their scrap book. The chapters presented within this book represent student data gathering as they explored the concepts presented in each of the three themed units:

1. Unique features of whales & dolphins
2. The conservation and protection of whales and dolphins
3. Whale watching

The completed scrap book is a visual representation of the learning pathway throughout each unit, which the student can present to the class and include in a class display for the library or at a whole-school or community event.

- Design and create a whale or dolphin jigsaw. Working individually or in pairs, ask students to locate an image related to whale watching, then prepare this to create a jigsaw puzzle for other students to solve. Although this activity is offered for students in the lower years to complete, the complexity of this activity can be increased or lessened to suit students of all age-groups. Teachers of students in the lower primary years could support students to complete this activity by removing stages such as image selection, preparation of jigsaw outline (i.e. providing a template to be used, etc).
1. Research, locate and print (or photocopy from a book) an image to be used for the whale watching jigsaw puzzle.
 2. Take a photocopy of the original image, onto either A4 paper (for individuals) or A3 sized paper (for pair work).
 3. Trace the image from the photocopy onto an art sketchpad. Students working in pairs need to agree upon an equitable manner of dividing the tasks within this activity.
 4. Glue the traced version of the image onto a piece of cardboard.
 5. Using a separate piece of blank paper, design and practice drawing the jigsaw puzzle shapes to be used on the image.
 6. Create a final version of the jigsaw shapes (using plain or tracing paper) to use on the actual picture when ready
 7. Colour the jigsaw image using water colours or other artist materials. Allow the paint to set or treat the materials (for example, applying fixative if crayons or pencils are used) to prepare for the “cutting” stage.
 8. Using the jigsaw puzzle shape template, trace the lines onto the coloured image.
 9. Use scissors to cut along the lines to create the pieces of the jigsaw puzzle
 10. Make a box to present and store the jigsaw puzzle.
 11. Swap puzzles around the class so that different groups get to use that puzzle. Donate these to the school library or a community organisation for other children to use.
- Present a play on the life of whales and dolphins that are seen by a whale watching tour.

4. FINDING OUT

4.1 Resources

Content areas	Object(s)	Location
Whale watching is becoming more and more popular. Tips for whale watching.	Binoculars	Bridge
Guidelines for watching whales and dolphins from land	Jetty/wheel turned left	Bridge
Guidelines for watching whales and dolphins from a boat	Boat/wheel turned right	Bridge
Types of whales and dolphins found in Australian waters (images and descriptions)	Laptop	Science Lab
Where around Australia do whales travel (migrate)? What time of year can you see different whales?	Chart Globe	Bridge Library
Images of whales & dolphins in their natural habitat	Projector screen	Library
Rules about approaching whales when in a boat – how close can you get?	Telescope	Research Centre
Rules about approaching dolphins when in a boat – how close can you get?	Telescope	Research Centre
Rules about approaching whales from above or below the water – how close can you get?	Porthole	Research Centre
Reporting whale sightings – how to do it, and what do you need to report?	Laptop	Research Centre
Video footage showing whales & dolphins in their natural habitat	TV monitors Porthole	Research Centre Office

Theme 3: Whale Watching

To complete the tasks students are asked to undertake (as explained in the section “Setting the inquiry”), students will use a variety of web-based and library resources to investigate the questions listed below.

1. DEW Whales and dolphins application – objects and location as per the above table
2. <http://www.environment.gov.au/coasts/species/cetaceans/whale-watching/index.html>
3. <http://www.environment.gov.au/coasts/species/cetaceans/whale-watching/see-whales.html>
4. <http://www.environment.gov.au/coasts/species/cetaceans/pubs/whale-watching.pdf>
5. <http://www.environment.gov.au/coasts/publications/cetacean-guide-report.html>
6. <http://www.environment.gov.au/coasts/species/cetaceans/sightings.html>
7. <http://www.environment.gov.au/coasts/species/cetaceans/sanctuary.html>
8. <http://www.environment.gov.au/coasts/species/cetaceans/industry.html#watching>
9. <http://www.environment.gov.au/coasts/species/cetaceans/rescue.html#report>
10. <http://www.abc.net.au/oceans/whale/char.htm>
11. Google Research – lookup “Whale watching” pages from Australia -
<http://www.google.com.au/search?hl=en&q=whale+watching&btnG=Google+Search&meta=cr%3DcountryAU>
12. International Fund for Animal Welfare – search “Whale watching” <http://www.ifaw.org/ifaw/general/default.aspx?oid=17909>

4.2 Finding out questions

In order to complete the activities outlined in *making connections* (previewed in *Setting the inquiry*), ask students to locate information relating to whale watching so they are able to answer the following questions:

Whale watching activities

- Q What are some different types of whale watching activities?
- Q Do you think that whales and dolphins always enjoy interacting with humans who are whale watching? Why?
- Q What do we know about annual whale migration patterns? Where do whales and dolphins travel and why?
- Q Where are the best places to go whale or dolphin watching? What species of whales and dolphins are you likely to see at these locations? When is the best time to go?

Rules about whale watching

- Q If you come across a whale or dolphin while in a boat, what are the rules about how close you can get to them?
- Q Are there any rules about swimming up to a whale or dolphin you might come across? If so, what are they?
- Q Are the rules about how close you can get to whales different from the rules for dolphins? If so, how?
- Q If you come across a whale that has stranded on beach, are there any rules that you should follow?
- Q If no rules existed about watching whales from sea, how could the actions of humans have a negative impact on our whales and dolphins?

The whale watching industry

- Q If you were operating a whale watching tour company, how would you ensure the safety of whales, dolphins and your clients?
- Q What impact does whale watching have on the whales and dolphins and their habitat?
- Q In your opinion, does the whale watching industry make a positive contribution towards the conservation and protection of whales and dolphins? Please explain why and how and provide examples to support your opinion.
- Q How could the practices and rules regarding whale watching be improved to better support the conservation and protection of whales and dolphins?

5. SORTING OUT

- 1. Whole-class knowledge discussion.** Commence the *sorting out* stage of student inquiry by asking students to each share a piece of information learned during their research (*finding out* stage). Facts are to be listed on one side of the board, with students then asked to nominate how the information might be sorted into categories. Ask for various volunteers to assist in drawing and developing a brainstorm chart, ticking off each listed fact as it is assigned. Keep a record of these findings as this chart will be displayed for future reference further within this unit.
- 2. Rules about approaching whales and dolphins when at sea.** Working in pairs or small groups, ask students to collate and display the information gathered regarding the rules about distances that must be kept between whales and dolphins during whale watching at sea. Working with multi-media or using art materials (A3 size), students produce a poster to represent these rules and include labelled diagrams for each situation. For an outline on how this information can be sorted using a mathematics-based activity, please refer to the *going further* section.
- 3. Produce a directory of whale watching companies.** Working individually, ask students to create a list of whale watching companies. Their list should include: company name, location, types of whale watching activities offered, time of year that tours are conducted, and the URL of the company's website.
- 4. Pros & cons of the whale watching industry.** Working individually, students create a list of all the positive and negative issues associated with the whale watching industry.
- 5. Cause & effect - issue listing and diagram.** Working as a whole class, students discuss and consider the ecological effects that whale watching activities (both organised and those that happen unexpectedly while people are at sea) can have on our whales and dolphins. This should be displayed on flip charts that can be retained and redisplayed by students during remaining activities.

6. GOING FURTHER

1. **Extension to the “Rules about approaching whales and dolphins” activity.** Working as a whole class outside, ask students to construct a physical representation of the distances that boats and people must keep between themselves and whales & dolphins when whale watching at sea, using themselves as the points for measurement. By providing an appropriate level of support (depending on age and ability levels), students will discuss and decide how to approach the task as they demonstrate their skills in estimation, measuring and calculating length.
2. **Extension of the “Directory of whale watching tour companies” activity.** This investigative activity can be extended to include a short summary of each organisation within the existing directory listing. Ask students to locate the following data for each entry within their existing list:

Q How much does it cost to go on a whale watching tour? Do you think this cost is reasonable? Why?

Q Is the company small or large? How many people does it employ? What type of training do you need to work for the company?

Q Does the company support the work of any other companies? If so, which companies are these and what do they do?

The report should conclude with a statement that summarises the organisations’ differences and similarities, and include a personal opinion comment regarding which organisation they would support and why.

3. **Extension to the “Pros & cons of whale watching industry” activity.** Building upon the work done previously where students produced a list of positive and negative outcomes that might arise from the practice of whale watching, ask students to write a few additional sentences for each listed item to further substantiate the statement and list the resources and references they located to support each claim. This will provide the additional information for students participating in the debate activity.
4. **Extension to the “Cause & effect” listing & diagram activity.** The scope of this cause and effect discussion could be extended by asking students to work individually to present and summarise the class’s findings by writing an exposition report, which could then be orally presented to the class or at a whole-school or community event.

7. MAKING CONNECTIONS

1. **Whole-class debrief/reflection of knowledge development:** Retrieve the fact sheets drawn up during class discussions at the *tuning in* and *sorting out* stages of this unit of inquiry. As a whole class, review and compare the facts known by the class about conservation and protection issues relating to whales and dolphins.
2. **Complete the inquiry activities** described in the “Setting the inquiry” section, pg 3-6). Based on the information gathered during the *finding out* and *sorting out* stages of inquiry, students will now have the information they require to complete the appropriate activities as outlined below:

For upper-level students (Yr 6-8)

- Whole-class project – setting up a whale watching Company

For mid/upper-level primary students through to middle school (Yr 5-6 and 7-8)

- Hold a debate
- Design a board game
- Select, investigate and present a report on four (4) different whale watching companies

For mid-level students (Yr 3-5)

- Prepare and deliver a presentation on the whale watching industry in Australia
- Write a story about a whale or dolphins experience with people who are whale watching
- Design a holiday package for a whale watching touring holiday
- Create a whale watching calendar
- Create an illustrated listing of the whale and dolphin species that can be seen around Australia

For lower-level students (Yr K-2)

- Add to an existing Scrap Book
- Design and create a whale or dolphin jigsaw
- Present a play on the life of whales and dolphins that are seen by a whale watching tour

3. **Write a journal.** Working individually, students reflect on their own learning journey as they work through each stage of the inquiry completed to date. This is the final entry for the topic.

8. TAKING ACTION

1. **Prepare and deliver a presentation for a whole-school assembly or parent & community event.** Working in pairs or small groups, plan, prepare and deliver a presentation on one of the following issues using an appropriate format, supported by visual aids (i.e. multi-media, visual art creations) to further illustrate and convey the information addressed within the presentation. The presentation should aim to provide a descriptive, persuasive and factual report regarding one of the following issues:
 - The whale watching industry
 - The rules that apply during whale watching – what these are, why they should be kept, and what would happen if they weren't
 - The benefits of whale watching (for both humans and our whales and dolphins)
 - Whale watching (both organised and random sightings) creates more risks for whales and dolphins than benefits
2. **Create and set up an information booth that promotes whale watching activities.** Design and produce an information stand that can be used to promote whale watching activities and the conservation and protection of whales and dolphins. Provide information regarding the rules that people need to follow when watching whales from either land or when at sea, stating what the negative impact whale watching can have on our whales and dolphins if these rules are not followed.

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