Antarctica
Unit Plan

Unit Overview

Unit Title

Antarctica

Unit Summary

Students will investigate Australia's involvement in Antarctica. They will investigate and hypothesise the environmental issues and be involved in research, comparative studies, and projections of data. Students will also create web pages, multimedia presentations and brochures and debate issues affecting Antarctica today.

Curriculum Links

Human Society and its Environment, Science and Technology, English

Year Level

Stage 3 – Years 5/6 NSW

Approximate Time Needed

12 x 60 minutes

Unit Foundation

Standards/Syllabus Outcomes

Human Society and Its Environment (HSIE)
ENS3.5 Demonstrates an understanding of the interconnectedness between Australia and global environments and how individuals and groups can act in an ecologically responsible manner.
ENS3.6 Explains the structures, roles, responsibilities and decision-making processes of state and federal governments and explains why Australians value fairness and socially just principles.

English
TS3.2 Interacts productively and with autonomy in pairs and groups of various sizes and composition, uses effective oral presentation skills and strategies and listens attentively.
WS3.12 Produces texts in a fluent and legible style and uses computer technology to present these effectively in a variety of ways.

Science and Technology
UTS3.9 Evaluates, selects and uses a range of equipment, computer-based technology, materials and other resources to meet the requirements and constraints of investigation and design tasks.
To access more information about the NSW HSIE, English and Science and Technology syllabuses visit NSW Board of Studies

Curriculum-Framing Questions	
Essential Question	How do humans impact on an environment?
Unit Questions	Why is Antarctica important to us? How can the Antarctic environment best be managed?
Content Questions	Where is Antarctica? What are its natural attributes? How is Antarctica changing? What has been the effect of human activities, Australian in particular, on Antarctica? Who explored Antarctica in the past and why? What do scientists research in Antarctica? What were/are the difficulties in exploring Antarctica?

Assessment Plan

Assessment Timeline

Before learning activities begin	While students work on learning activities	After learning activities end
• Brainstorm • KWL Chart • Questioning	• Web Quiz • Multimedia Checklist • Teacher observation • Discussion feedback • Teacher feedback • Debate/forum • Survey evaluation • Student assessment of brochure • Wiki Checklist	• Brochure Rubric • Blog Rubric • Questioning • Reflection • Multimedia Evaluation Tool • Evaluation product/unit

Assessment Summary

Students will be assessed on their presentations, publications, blog and web pages as per the criteria established in the evaluation tools for each task. Students to submit research graphic organisers used and storyboard of multimedia. Assessment tools provided for students as tasks are introduced to form scaffolds for students.
Multimedia Checklist
Wiki Checklist
Multimedia Eval Tool
Brochure Rubric
Blog Rubric

Unit Details

Prerequisite Skills

Students Prior Knowledge	*Word processing skills* *Internet research skills* *Library information search skills*
Teachers' Processional Learning	*Knowledge of using blogs and wikis* *Understanding of using an online survey tool* *Teachers in stage could form a Professional Learning team and collaboratively create a blog template and/or a wiki for students to use*

Teaching and Learning Strategies

Brainstorming will be used throughout this unit to enable the students to develop their areas of research. Internet skills will be taught and Internet safety emphasised. Students will be researching using the Internet. Useful websites will be available via the intranet.

Modelling will take place throughout this unit via the prepared guide sheets, web pages and brochure.
Debates will be held on issues concerning Antarctica today.
Students will work in a mix of group and partnerships.
Classroom displays- Map of Antarctica, KWL charts, Internet sites, PMI, current affair clippings concerning Antarctica, etc.

Class discussions will take place regularly throughout this unit.

Teaching and Learning Activities

Teacher introduces unit of work by posing the question "How do humans impact on an environment?" Teacher draws out student prior knowledge about environmental issues in general, and asks what they know about environmental changes in Antarctica in particular.

- In pairs students begin to construct a KWL chart, which they will use a little later in the unit.
- To encourage student inquiry and build on previous knowledge, teachers may use a variety of materials. The DVD "Wildest Antarctica and Arctic" is particularly recommended.
- Teacher poses the content questions "Where is Antarctica?", "What are its natural attributes?" and "How is Antarctica changing?" Students share their knowledge and add to their KWL charts in pairs.
- Teacher has the students individually complete the Web Quiz. Students work in pairs to write their own version of a Web Quiz on Antarctica for other Stage 3 classes to complete.
- Teacher poses further content questions "What has been the effect of human activities, Australian in particular, on Antarctica?", "What do scientists research in Antarctica?" and "Who explored Antarctica and why?"
- Pairs work on finalizing their KWL chart.
- As a class teacher leads a review of all ideas entered into KWL charts, and composes a class KWL organizer.
- Using the "What I want to Know" column of the KWL chart and working in pairs, students categorise areas for student research – for example, fishing industry, mining, environmental issues, Antarctic explorers. Graphic organisers such as Venn Diagrams may be used to help students identify similarities and decide on categories for the "What I Want to Know" column of the KWL chart.
- Students work in small groups (no larger than 3 students per group) to select an area of interest from the KWL chart and to develop their research. Teachers will find it helpful to create a virtual bibliography prior to this stage. Teacher discusses the progress and direction of the groups' research. He/she refers back to the curriculum framing questions to guide their research. Students record their sources in Sample Works Cited document and Internet Citation document. Graphic organizers will help groups of students to explore their area of research further.
- Student groups prepare a storyboard of their proposed multimedia presentation on their research for approval by the teacher. The document Tips for using Microsoft PowerPoint* may be useful to students.
- Students complete their multimedia presentations and present them to the class.
- Teacher introduces the content question "Who explored Antarctica and why?" Students discuss what they know already about the difficulties of Antarctic exploration in the past and the motives for it. Teacher prompts discussion of who carries out research on the continent now and why, and the differences between modern equipment and facilities compared to those of early explorers.
- The book "Pole to Pole" by P Freeman and P Blyth is recommended for initial investigation into the topic of Antarctic exploration.

- In groups students research one explorer per group and produce a proposed layout of content and design for a website on their explorer. Teacher provides feedback and suggests more research, possibly alternative foci in some areas where appropriate. Students use the Research Guide Sheet to assist their information gathering.
- Students compile their websites which become part of the class input to the school intranet for a larger audience.
- Using graphic organizers, students compare and reflect on the equipment used by past and present explorers in Antarctica. Group work, followed by pair work will help students to contemplate this topic further. Teacher guides student discussion of the question "What were/are the difficulties in exploring Antarctica?"
- Students write individual reflection on the challenges faced by past and present explorers.
- Using the knowledge they have acquired so far both prior to this unit, and during the unit to date, students as a whole class brainstorm "Issues Concerning Antarctica". Areas such as whaling, sealing, mining, scientific research, tourism, the ozone layer, global warming are some likely areas for discussion. Teacher poses the questions "Why is Antarctica important to us?" and "How can the Antarctic best be managed?" Students may also consider if Australian answers to these questions might be different from those of people from other countries.
- Students work in groups of 5 with each group adopting one of the following roles: mining company representative, scientist, tourism operator, fisherman, environmentalist. Their final task in this group is to respond to the statement, "Antarctica should be left to the penguins".
- Groups research their particular role together. For example, the scientists research what science studies takes place in Antarctica, and how different personnel within a mining company might respond to the statement. Students record their research sources and make notes to use later. Some students may wish to record their ideas and findings in a blog. Use the blog rubric to guide student work. This sample shows the type of blog a group examining the issues from a scientist's point of view might develop.
- Teacher uses the Higher Order Thinking document to guide students through group work. The group responses can take a variety of forms, but responses must include justification of their group's position on the issue. Responses are displayed to the class and thereafter to the school community.
- The class devises a school survey to assess the opinion of the school population. This survey is conducted via a website on the school intranet. Other classes at the school may also wish to conduct debates based on the research collected during this unit of work and the group responses displayed within the school.
- Students view sample brochures and decode the layout and style of writing. Working in pairs, students choose an issue concerning Antarctica which most interests them and develop their own brochure using the factual information gathered during the research.
- Groups address the question "How can the Antarctic environment best be managed?" Students use the research they conducted as miners, scientists, tourism operators, fishermen or environmentalists to conduct a debate on differing perspectives on how we should manage Antarctica. Students discuss possible differences in perspectives between Australia and other countries.
- As an extension activity students may use the knowledge they have acquired to predict in a wiki what Antarctica might be like in 2050 if there were no restrictions on human access to its resources.

Accommodations for Diverse Needs	
Students with Special Needs	Mixed ability partnerships/groups. Tips for using Microsoft PowerPoint*, peer mentoring, negotiated timelines, negotiated modifications of tasks.
English as a Second Language (ESL) Students	ESL teacher involved within the class – providing extra assistance for these students
Gifted Students	Students are involved in open-ended activities, debating, developing collective understandings, etc.
Indigenous Groups	Tasks can be negotiated according to individual needs.

Materials and Resources Required for Unit

Technology – Hardware (Click boxes of all equipment needed)

☒ Camera ☒ Computer(s) ☒ Digital Camera ☒ DVD Player ☒ *Internet Connection*	☐ Laser Disk ☒ Printer ☒ Projection System ☒ Scanner ☒ *Television*	☒ VCR ☒ Video Camera ☒ Video Conferencing Equip. ☒ *Other MP3 Player, Interactive Whiteboard, PDA Mobile Technologies*

Technology – Software (Click boxes of all software needed.)

☒ Database/Spreadsheet ☒ Desktop Publishing ☒ E-mail Software ☐ *Encyclopedia on CD-ROM*	☐ Image Processing x Internet Web Browser ☒ Multimedia	☒ Web Page Development ☒ Word Processing ☒ *Other Editing software, Internet Web Browser, Animation Software, Digital learning objects*

Printed Materials	textbooks, story books e.g. Pole to Pole by P. Freeman and P. Blyth, manuals, reference materials etc.
Supplies	**Video** DVD: *Wildest Antarctica and Arctic* (Released 2004 by Quantum Leap Group Ltd, Entertainment Services Ltd) **Book** *Pole to Pole* Freeman, P & Blythe, P. 2000, Koala Books, Mascot. **Internet Resources:** http://bestanimations.com/Animals/Birds/Penguins/Penguins.html http://www.australiansatwork.com.au/mawson/mawson_en9-10.php http://simplythebest.net/sounds/WAV/sound_effects_WAV/nature_wavs.html http://svs.gsfc.nasa.gov/search/Series/Antarctica.html http://www.aad.gov.au/default.asp?casid=5587 http://www.abc.net.au/btn/australians/mawson.htm http://www.antarctica2000.net/ http://svs.gsfc.nasa.gov/vis/a000000/a000900/a000990/index.html http://www.antarctica2000.net/frameset.html http://www.antarcticaonline.com/antarctica/home/home.htm http://www.australiansatwork.com.au/mawson/mawson_en9-10.php http://www.classroomantarctica.aad.gov.au http://www.findsounds.com/ISAPI/search.dll?keywords=ocean+surf+waves http://www.mawson.sa.gov.au/timeline.htm

	http://www.ousland.no/english/trips_south_pole.html
Internet Resources/ Communication Tools	http://edublogs.org/ Edublog site for hosting blogs http://pbwiki.com/ Hosting site for wikis
Other Resources	*Field trips, experiments, guest speakers, mentors, other students/ classrooms, community members, parents, etc.*

Credits

Gillian Maugle and Amenah Mourad participated in the Intel® Teach Program which resulted in this idea for a classroom project. A team of teachers expanded the plan into the example you see here.