DEPARTMENT OF EDUCATION, QUEENSLAND

MARINE STUDIES

SYLLABUS

1984

FOREWARD

It is significant that Mr Bob Moffatt responded to the need for a Marine Studies Program in the year that the Australia II syndicate made the first victorious challenge for the America's Cup. Future challenges to be held in Australian waters will surely increase Australian consciousness of our Maritime aspirations.

If we as Queenslanders have neglected to fully avail ourselves of our maritime heritage, publication of this program must rectify this situation.

Lord Hirschfield, Governor of the London School of Economics and President of Howarth International, stated on a recent visit to Australia that citizens of tomorrow world will have more money in their pockets, have an improved life style with greater leisure activities and cheaper goods.

He envisages the hospitality industry with its allied services, becoming the boom industries of the future. Tourism, already the second largest income earner for Queensland, must develop even further. The maritime industries, already so much a part of our tourist industry, must share in this development.

The vision of Mr Bob Moffatt in designing this course, his attention to detail and his ability to relate the course to the needs of students have produced a program of great appeal to students and teachers alike.

The program is drawn from not only Mr Moffatt's own extensive educational and recreational experiences but also the multitudinous marine expertise available on the Gold Coast. A Marine Studies Centre is at present being developed at Benowa State High School in order to establish the Marine Studies Program on its own home ground. Even though the project has been primarily aimed to cater for the local community, basic skills and tenets outlined in the program will be applicable to other marine situations.

I have great pleasure in "launching" this Marine Studies Program; may it benefit all those who love the marine life.

C. W. Connell

Deputy Director Secondary
Department of Education

PREFACE

This is a condensed version of a more fully developed document that is available from the Transition to Work Project of the Queensland Department of Education. At the time of publication the Syllabus is intended for Senior Secondary school students who do not wish to seek Tertiary entry. The syllabus, if taken in its entirety, can consitiute a school workprogramme and will be given accreditation from the Queensland Board of Secondary School Studies as a board registered School subject. It is hoped that in the not too distant future, to have a number of schools trial the syllabus as a pilot course, so that it may gain accreditation for a Board of Secondary School subject that will qualify students for tertiary entrance.

To develop such a course of study is beyond the scope of one person and the author would like to thank the following institutions and centres for their assistance and advice.

The Centre for Maritime Studies (Canberra); The Great Barrier Reef Marine Park Authority and The Australian Institute of Marine Science (Townsville); The Marine Section National Parks and Wildlife Service (Brisbane and Rockhampton); Jacobs Well and Boyne Island Field Study Centres; The S.T.E.Project Qld Department of Education and Benowa and Gladstone State High Schools.

He would also like to thank the following for their advice, assistance and much valued criticisms

C. Allen; J. Baker, D. Bridger, B. Daniljchenko, G. Rossiter, I. Ingold, D. Kopelke, A Martin, R. McAllister, P. Moffatt, N. Primrose, K. Petersen, L. Sampson, P. Stannard, D. Tulip, L. Zell.

Finally as this is a first attempt, any comments you may wish to make would be gratefully received. May I leave you with the words of Kenneth Graheme who wrote

" Believe me, my young friend, there is NOTHING - absolutely nothing - half so much worth doing as simply messing about in boats"

Bob Moffatt

June 1984

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1. TITLE

Marine Studies

2. LEVEL

The subject is intended for any Senior Student.

3. RATIONALE

3.1 *Relevance to Student Needs*

The Course is designed to develop in students an awareness of the Marine Environment that will affect their recreational life or future employment. In part this is a practical course designed to develop knowledge, skills and attitudes associated with the Maritime World but has a second component of knowledge to enable the student to aquire related skills of validating, organising, interrelating and utilising such knowledge critically and constructively in order that he/she might be culturally and scientifically informed and aware of the Marine World.

There are two parts to the course, each relevant to the 2 components of theory and practice. There is also the element of Work Experience and observation which sets personal standards of workmanship and sense of responsibility which prevail in the community.

3.2 *Challenge Appropriate to the Developmental Level of the Students for Whom the Studies are Proposed*

Marine studies offers students an opportunity to develop an awareness and understanding of those aspects of the marine environment which will play an important part in their lives, be it in a recreational, or an occupational capacity. Significant aspects of the marine environment include:

* Navigation
* Boating
* Swimming and Diving
* Commercial and Recreational Fishing
* Marine technology and Research
* Obtaining Licences to Operate Equipment
* Management of its Resources
* Historical Significance
* Living and Working on the Coastal Zone and in the Oceans

3.3 *Represents a Significant Area of Study and Relevant to the Needs of Australian Society*

The first space explorers who viewed the earth from outer space described it as a 'Blue Planet'. This is not surprising since nearly 3/4 of the earth's surface is covered by water. Many aspects of human endeavours have been and are linked to the Marine Environment.

Approximately 75% of Australians and over 80% of Queenslanders live within one hour's drive from the sea. Most of the economic activity takes place in the coastal zone. Our waterways, beaches, islands and coastal lands contain our homes and our jobs, and are our major recreational facility. Our seas and their surrounds have many unique and aesthetically appealing features, which are valuable in their own right. There are over 86,000 registered boats in Queensland.

The prospects for utilizing the sea to meet the needs for the future are seen, internationally, to be increasing rather than diminishing. The potential of Australia's maritime resources is considerable, but future development requires careful management. We need to foster, yet balance our entrepreneurial energies and skills in developing resources for our use with the need for the unique and beautiful features of the sea to be carefully managed for their preservation.

However, the Australian community has historically had little direct involvement in and thereby awareness of the utility of the sea (except for leisure purposes), or of the sensitive needs of its management and preservation. Our traditions and culture have developed with an "inlands" perspective while our maritime interests have been serviced, in the main, by overseas interests. Our commercial involvement in maritime issues is generally limited, although the offshore oil industry has now reached international proportions. Our efforts in marine science and technology have recently been strengthened.

Australia is a major international trading nation. We rank seventeenth in the world trade in value terms. We are dependant upon the sea for movement for virtually all our exports which are approaching 200 million tonnes annually and worth over $27 billion, accounting for around a quarter of our Gross Domestic Product. Our coastal trade is also important and this applies not least to Queensland.

Extensive natural resources of commercial value (both living and non-living) exist about our 20,000 kilometres of coastline, territorial waters, and exclusive economic zone. Our fisheries, though only partly explored, show promise of moderate economic potential. The world's major fishing nations have all taken an interest in Australia's maritime resources and probably know more about them than we do.

Our defence is strongly oriented towards the sea and we have a large offshore area to be covered by coastal surveillance. The UN Law of the Sea Convention, which brings greater clarity to the gamut of our maritime interests, has recently been concluded and Autralia is a major beneficiary from its provisions.

This Marine Studies Course seeks to provide students with the opportunity to aquire the basic set of skills which are essential for working at sea as well as providing co-ordinated approach towards the study of all those facets of modern life which interact in the marine environment.

4. GLOBAL AIMS

The aim of Marine Studies in our Secondary Schools is to provide for the development of compentencies, attitudes and values that will enable students to:

(1) Develop a knowledge and understanding of our maritime interests and environment

(2) Develop an awareness of the usefulness and value of the sea and coastal zone.

(3) Develop an awareness of the responsibility for wise management in the course of present use and preservation for the future, and the regulations developed to achieve that.

(4) Develop an ability to use the Marine Environment wisely.

(5) Develop a competence in basic Maritime Skills.

(6) Develop an ability to communicate attitudes and values about our maritime interests and environment.

(7) Develop a new "WATER ETHIC" amongst Australians so future generations can benefit from its resources.

5. ORGANISATIONAL NOTES

5.1 *The following units of work have been prepared.*

UNIT 1: Navigation (20 hours)

This is the art of directing a vessel at sea and is fundamental to any work in the sea. It is also a topic which can easily be mastered by the majority of students and has been shown to be of value in promoting success among low ability students. The topic is an introductory one and does not cover all possibilities. It is designed for inshore navigation. TAFE marine studies courses are seen to fill the prevocational need for further development of this topic.

UNIT 2: Boating (45 hours)

There are very few power boat driving academies for the Queensland public, yet there are well over 86,000 registered power boats. Many boating skills are at present haphazardly aquired and far too many accidents occur because of ignorance. This topic considers basic aspects of seamanship, safety, first aid and maritime regulations governing the boating public. Major emphasis in this topic should be placed on responsibility, self confidence and commonsense, all of which go to close the ignorance gap. The term boat refers to power, sail, row or paddle.

UNIT 3: Swimming and diving (15 hours)

Over 80% of Queenslanders live within one hours drive of the ocean. The vast majority of these will at some time swim, surf or dive in the sea. For many a time will arise when they have to save a life from the sea. Few people are taught surf safety and yet even fewer are taught surf rescue, yet as adults they will let their children swim in the surf or buy them snorkeling equipment for gifts. Overexposure of the human body while swimming makes it vulnerable to skin cancer liable of being stung or bitten by marine life. It is an advantage to know what to do in these cases and will help keep a healthy body. Finally, with the invention of SCUBA, a whole new world has opened up for humankind, and enables us to appreciate the beauty of the sea.

UNIT 4: Commercial and recreation fishing (30 hours)

If humankind is to obtain some of its food from the sea in the future then we must learn to make full use of this renewable resource wisely. We must develop advanced fishing methods, learn to eat more fish and develop sensible management procedures.

UNIT 5: Marine technology and research (29 hours)

Each year large amounts of money are spent on marine research and technology. Humankind should realise that to develop the seas resources, technology and research are needed. Students studying this topic should gain an insight into the types of reseach that are conducted in the sea as well as realise that research is slow and often does not yield many results. The thrust in this topic should be towards the students designing a piece of RESEARCH APPARATUS. As a result they should be encouraged to test out their design and learn from first hand experience the frustrations and technology needed to research the sea. The emphasis should on simplicity in design, practicability and keeping the cost to a minimum. Complicated techniques and sophisticated equipment should be demonstrated and where chemical techniques are employed the emphasis should be on the results and not on the theory.

UNIT 6: Marine resources; Value and management (12 hours)

Every part of the Queensland coast is managed by an authority. The Navy and State Emergency Service manage its defence and disasters; The Great Barrier Reef Marine Park Authority and National Parks and Wildlife Service manage the conservation; the Surf Life Savers, The Boating Patrol manage people and their activities; the Beach Protection Authority and the Harbours and Marine manage the ports, harbours and engineering. Quite often in the media we see different conservation and development groups seeking different management strategies. Finally with the declaration of the Great Barrier Reef, it is important for all Australians to understand the practical difficulties associated with the day to day and long term management of a marine ecosystem. We also must learn to appreciate the value of marine resources.

UNIT 7: Marine history (10 hours)

Australian history is vested in the sea. The aboriginals have used it for about 40,000 years, and the Torres Strait Islanders for a little less. The achievement of some of our early European navigators is quite remarkable when considers the resources they worked with. There have been many Australian maritime achievements which have made history and are worthy of study. There are many famous wrecks that are studied for historic and commercial gain. The study of wrecks can give the student an appreciation of the tragedies that can occur and the huge financial losses suffered by individuals who spend large amounts of money building boats.

UNIT 8: Coastal Studies (29 hours)

Because such a large number of Queenslanders live within one hours drive to the sea, many will spend their holidays at some type of coastal area. For schools that are on the coast, there is a special type of coastal environment which pervades the lifestyles of students. It is important for students growing up in this coastal atmosphere to realise the problems associated with it. Equally important is the problem of visitors to the coastal areas adopting codes of behaviour that are different to that of their normal lifestyle.

UNIT 9: The oceans (10 hours)

The activities of other countries will affect our seas because of the soluble nature of seawater and ocean currents. There are many who claim that the sea is an untapped resource and holds many riches in food, minerals and oil. Yet almost every sailor who travels the sea comments on how dirty they are becoming. Indeed they are Humankinds unseen garbage dump and because of this are poorly managed. The law of the sea conferences cannot agree on who should own what and so it is up to all nations to develop a common policy. When this is finally developed the syllabus topic will be written in accordance with these policies in mind. Whatever the outcome, there is a need now to create a person who is aware of the social issues and is convinced that there is a way of dealing with these in a constructive manner. There also is a need to understand trade, and shipping. Studies of different trade routes and shipping technology are important.

UNIT 10: Boat Licence and Excursion (20 hours)

The aim of this unit is for students to obtain their boat licence and then put into practice all the elements of the course to varying levels of emphasis as deemed by the teacher and the way he/she has developed units 1-9.

5.2 *Suggested Course Outline*

APPROX. TERM *	PART A PRACTICAL *COULD BE YEAR 11*	PART B APPLIED *COULD BE YEAR 12*
1	UNIT 1 NAVIGATION (20 hours) UNIT 2 BOATING (BEGINS)	UNIT 5 MARINE TECHNOLOGY AND RESEARCH (29 hours)
2	UNIT 2 BOATING (45 hours)	UNIT 6 MANAGING MARINE RESOURCES (12 hours) UNIT 7 HISTORY (10 hours)
3	UNIT 2 (FINISHES) UNIT 3 SWIMMING AND DIVING (15 hours)	UNIT 8 COASTAL STUDIES (29 hours)
4	UNIT 4 FISHING (30 hours)	UNIT 9 THE OCEANS (10 hours) UNIT 10 EXCURSION & BOAT LICENCE (20 hours)
TOTAL GRADE 11 110 HOURS		TOTAL GRADE 12 110 HOURS
* Note: There will be some overlap between terms due to varying length of units.		TOTAL COURSE 220 HOURS

5. GENERAL OBJECTIVES

The general objectives of the programme have been grouped by unit. It is recognised that some process and skill objectives are relevant to several units.

UNIT 1: Navigation (20 hours)

This is the art of directing a vessel at sea. It is fundamental to any work in the sea. It is also a topic which can easily be mastered by the majority of students and has been shown to be of value in promoting success among low ability students. The topic is an introductory one and does not cover all possibilities. It is designed for inshore navigation. TAFE marine studies courses are seen to fill the prevocational need for further development of this topic.

Content Objectives

The student should have a knowledge of:

(a) The marine compass
(b) The chart
(c) Lights and lighthouses
(d) The terms: dead recknoning laying off and plotting
(e) Weather and weather forecasts
(f) Tides and their causes
(g) Ocean currents
(h) Distress and emergency
(i) Modern navigational aids

Process Objectives

The student should be able to:

(a) Interpret readings from navigation equipment
(b) Solve problems relating to chartwork involving distance, speed and time
(c) Select appropriate equipment for navigating
(d) Lay off a course between two or more points on a chart
(e) Plot a course, organise and communicate information at sea
(f) Write up reports
(g) Interpret a set of tide tables
(h) Interpret local harbour charts and drawings
(i) Apply the boating rules to new situations
(j) Interpret a weather map
(k) Draw a weather map from a radio broadcast

Skill Objectives

The student should be able to:

(a) Use parallel rules, dividers, compasses and charts accurately
(b) Send and receive a MAYDAY
(c) Read a baramoter, chronometer and ships log
(d) Take accurate compass bearings
(e) Steer a course from a set of compass bearings
(f) Use a marine radio

Affective Objectives

The student should:

(a) Develop a respect for the sea
(b) Realise that working at sea is slow and difficult at times
(c) Appreciate the influence that weather has on vessels at sea
(d) Value and take notice of the weather forecast
(e) Value the boating rules
(f) Derive satisfaction from mastering the art of navigation

Electives

Satellite or Celestial Navigation; The sextant; Radar; RDF; Auto Pilots; Famous Australian Navigators; Ocean Passages; Planning a voyage (e.g. Provisions lists, course); Role of Coast Guard, Coastal Surveillance.

UNIT 2: Boating (45 hours)

There are very few power boat driving academies for the Queensland public, yet there are well over 86,000 registered power boats. Many boating skills are at present haphazardly acquired and far too many accidents occur because of ignorance. This topic considers basic aspects of seamanship, safety, first aid and maritime regulations governing the boating public. Major emphasis in this topic should be placed on responsibility, self confidence and commonsense, all of which go to close the ignorance gap. the term boat referes to power, sail, row and or paddle.

Content Objectives

The student should have a knowledge of

(a) Methods used to buy a boat and associated warranties
(b) Boat types and materials
(c) Boat fittings, sails and equipment
(d) Boat motors, fuel tanks and fittings
(e) Boat and trailer maintenance
(f) The boating rules and safety procedures
(g) Safety equipment
(h) How to get a power boat licence
(i) The coastguard
(j) Preparing a boat for sea

Process Objectives

The student should be able to:

(a) Distinguish between boats in good and bad condition
(b) Understand manufacturers pamphlets and power ratings for boats and motors
(c) Understand and implement safety rules and regulations
(d) Understand a weather forecast and use a set of tide tables
(e) Interpret labels and instructions on bottles, cans and containers
(f) Recognise when a craft or motor is unsafe for use at sea
(g) Fill out a warranty claim form
(h) Follow a workshop manual
(i) Make accurate observations of sea conditions, bars and banks while boating

Skill Objectives

The student should be able to:

(a) Perform basic seamanship tasks (eg: Tie knots, cast off, operate equipment, etc.)
(b) Prepare a boat for sea following a set routine
(c) Operate a boat under power
(d) Sail a boat over a predetermined course
(e) Perform regular maintenance on a motor, trailer and battery
(f) Demonstrate correct use of safety equipment
(g) Navigate an inland waterway under power, sail, oar or paddle

Affective Ojbectives

The student should:

(a) Value the need for the boating rules and obey them
(b) Co-operate with those who seek to enforce them
(c) Be helpful of others especially those in trouble
(d) Respect other people's personal property
(e) Respect the weather forecast and coast guard warnings on bar crossings
(f) Appreciate that over consumption of alcohol leads to many boating accidents

Electives

Survey of boat ramps for people's attitudes towards their boat, fishing or recreational value of Boating; Winsurfing; Canoeing; Catamaran, Build a boat as a class exercise; Outboard motor maintenance. Teachers should consult with their local T.A.F.E. college for possible link courses.

UNIT 3: Swimming and diving (15 hours)

Over 80% of Queenslanders live within one hours drive of the sea. The vast majority of these will at some time swim, surf or dive in the sea. For many, a time will arise when they have to save a life from the sea. Few people are taught surf safety and yet even fewer are taught surf rescue, yet as adults they will let their children swim in the surf of buy them snorkeling equipment as gifts. Overexposure of the human body while swimming makes it vulnerable to skin cancer liable of being stung of bitten by marine life. It is an advantae to know what to do in these cases and will help keep a healthy body. Finally, with the invention of SCUBA, a whole new world has opened up for humankind, and enables us to appreciate the beauty of the sea. It may be useful to consult with staff from other departments e.g. Physical Education.

Content Objectives

The student should have knowledge of:

(a) Pool and surf swimming techniques
(b) Basic physiology and physics associated with swimming and diving
(c) Dangerous marine organisms and associated first aid
(d) Sea, surf and sun safety

Process Objectives

The student should be able to:

(a) Recognise dangerous swimming situations
(b) Contribute to Discussion: case histories of swimming accidents
(c) Survey swmimming attitudes and abilities
(d) Propose good health habits for surf, sun and water swimming
(e) Debate the regulations that now govern SCUBA in Australia

Skill Objectives

The student should be able to:

(a) Swim a set distance over a predetermined course and time
(b) Float, treadwater and help others float and keep warm
(c) Become competent in one type of sea activity: Snorkeling, Surfing, Life Saving, Competetive surf or pool swimming
(d) Demonstrate how to rescue a person from the surf, rip or near coastal waterway
(e) Demonstrate basic first aid with stings and marine bites
(f) Demonstrate Mouth to Mouth Resuscitation and Externation Cardiac Massage correctly

Attitude Objectives

The student should:

(a) Develop a code of behaviour consistent with swimming, diving or surfing safety
(b) Be willing to help those in trouble in the surf of sea
(c) Value the existence of swimming regulations
(d) Respect and co-operate with those who seek to enforce these regulations

Electives

Note: Consult with P.E. staff not to overlap on aquatics and to complement their programme. Also some water skills take a long time to develop unless acquired by the student prior to the course, e.g. surfboard riding. Care should be taken in the selection of elective work expecially SCUBA.

Snorkeling, SCUBA diving, Surfboard riding, Competitive swimming, swimming club, Bronze Medallion, Beach Inspector surveys, Survey of Family Swimming competence, class lifesaving competence before and after course.

UNIT 4: Commercial and recreational fishing (38 hours)

If humankind is to obtain some of its food from the sea in the future then we must learn to make full use of this renewable resource wisely. We must develop more efficient fishing methods, learn to eat more fish and develop sensible management procedures.

Content Objectives

The student shall have knowledge of:

(a) Types of edible fish
(b) Fish habitat reserves, closed seasons, legal sizes and correct equipment
(c) Fishing methods for the amateur
(d) Materials used in rods, lines, hooks, sinkers and associated gear used by Fishermen
(e) Fish poisoning and poisonous fish parts
(f) Fish breeding grounds
(g) Commercial fishing methods
(h) Marine food chains
(i) Safety associated with fishing
(j) Preservation and cooking methods
(k) Mariculture

Process Objectives

The student should be able to:

(a) Identify different fishing rigs and discuss their uses
(b) Debate fishing regulations and propose reasons for them
(c) Use a book to identify types of fish caught
(d) Use a recipe book to prepare and cook a fish
(e) Analyse trawler catches

Skill Objectives

The student should be able to:

(a) Catch a fish
(b) Fillet, clean and gut a fish
(c) Make a crab pot
(d) Cook a variety of fish
(e) Use a microscope to identify stages of fish development
(f) Maintain an aquarium so as to study fish natural history
(g) Draw a fish
(h) Dissect a fish

Affective Objectives

The student should:

(a) Develop the "Enough fish for one meal" ethic
(b) Obey the fishing regulations
(c) Value the need for fish conservation
(d) Appreciate the need for hygenic and thoughtful preparation of fish
(e) Appreciate the value of fish as a food

Electives

Work experience on a trawler; aboriginal and islander fishing methods; deep sea fishing; long line fishing; the Tuna Fishery; Fish taxanomy, Fisheries Biology, Plankton farming, Edible seaweeds, Fishing gear for different situations; The Prawning industry, Fishing Clubs, Fisheries Economics, The Marlin Fishery.

UNIT 5: Marine technology and research (29 hours)

Each year large amounts of money are spent on marine research and technology. Humankind should realise that to develop the seas resources technology and research are needed. Students studying this topic should gain an insight into the types of research that are conducted in the sea as well as realise that research is slow and often does not yield many results. The thrust in this topic should be towards the students designing a piece of RESEARCH APPARATUS. As a result they should be encouraged to test out their design and learn from first hand experience the frustrations and technology need to research the sea. The emphasis should be on simplicity in design, practicability and keeping the cost to a minimum. Complicated techniques and sophisticated equipment should be demonstrated and where chemical techniques are employed the emphasis should be on the results and not on the theory.

Content Objectives

The student should have knowledge of:

(a) A variety of practical research methods used to study the sea
(b) Some marine research instrumentation and equipment
(c) The limitations caused by available technology
(d) Some of the work done at a marine technology centre
(e) Materials used in the construction of apparatus in marine research
(f) Corrosion and decay
(g) Solar and wind powered equipment for marinecraft

Process Objectives

The student should be able to:

(a) Research the meaning of marine technology and research in the media
(b) Given the purpose, design an instrument that can trap a sample of water for anaylsis
(c) Select the appropriate technology
(d) Field test the design and modify if necessary
(e) Design an experiment to test some property of seawater
(f) Use the instrument made and tested to research a experiment effectively
(g) Communicate the results of the technology and research

(h) Fill out a work injury report

Skill Objectives

The student should be able to:

(a) Build an instrument for collecting a seawater sample
(b) Operate the instrument successfully at sea
(c) Use a microscope buretteor balance to examine the water sample at different coastal loations
(d) Make relevant drawings
(e) Use relevant chemicals and glassware to study the sample collected
(f) Demonstrate safe and correct research procedure
(g) Demonstrate care in the use of other field equipment

Affective Objectives

The student should:

(a) Appreciate that marine research is time consuming and expensive
(b) Appreciate that the sea is extremely corrosive

Electives

Work experience at a marine research laboratory at a technical level, Study of work done at the Australian Maritime College, Australian Insitute of Marine Science, James Cook, Qld, Sydney, or other Universitites; Take on a year long research project e.g.: Temperature in an estuary over a year.

UNIT 6: Marine resources; Value and management (12 hours)

Every part of Queensland coast is managed by an authority. The Navy and State Emergency Service manage its defence and disasters; The Great Barrier Reef Marine Park Authority and National Parks and Wildlife Service manage the conservation; the Surf Life Savers, The Boating Patrol and people and their activities; the Beach Protection Authority and the Harbours and Marine manage the ports, harbours and engineering. Quite often in the media we see different conservation and development groups seeking different management strategies. Finally with the declaration of the Great Barrier Reef, it is important for all Australians to understand the practical difficullies associated with the day to day and long term management of a marine ecoysystem. We also must learn to appreciate the value of the marine resources.

Content Objectives

The student should have a knowledge of:

(a) Government and non-government authorities that manage our coast and offshore reefs
(b) The regulations that these management authorities seek to impose on the public
(c) The local regulations for a particular area
(d) Practical measures that can be taken to conserve marine resources
(e) The consequences of wrongful action in managed areas
(f) Recall marine resources that are in need of management

Process Objectives

The student should be able to:

(a) Discuss marine resource management objectively
(b) Recognise the need for compromise between different user groups
(c) Research the conflicts that arise between different user groups
(d) Present a case in debate for the need for so much management
(e) Research the management of a local area (Beach, reef, swamp, canal, etc.)

Skill Objectives

The student should be able to:

(a) Fill out a permit application to use a marine resource
(b) Demonstrate practical conservation methods when in a marine national park

Affective Objectives

The student should:

(a) Adopt a code of behaviour consistent with marine management regulations
(b) Appreciate the existence of legitimate differences of opinion between management authorities
(c) Develop a personal opinion towards marine resource management

Electives

Detailed study of a marine management authority in a local area/ Work experience in the management authority; Field Trip to a Great Barrier Reef Island to study practical marine park management; Visit to a local habitat reserve to locate boundaries and study regulations. In all of the above cases the relevant authority should be contacted beforehand and any necessary permits or forms completed. The appendix lists the management authorities in Queensland.

UNIT 7: Marine History (10 hours)

Australian history is linked with the sea. The aboriginals have used it for about 40,000 years, and the Torres Strait Islanders for a little less. The achievement of some of our early European navigators is quite remarkable when one considers the resources they worked with. There have been many Australian maritime achievements which have made history and are worthy of study. There are many famous wrecks that are studied for historic and commercial gain. The study of wrecks can give the student an appreciation of the tragedies that can occur and the huge financial losses suffered by individuals who spend large amounts of money building boats.

Content Objectives

The student should have knowledge of:

(a) The insurance system used for boats and payment for wrecks
(b) Use of the sea by the aboriginals and islanders present and past
(c) Famous Equopean Navigators who sailed Australian waters
(d) Some famous Australian voyages
(e) Some famous Australian wrecks and how they occurred

Process Objectives

The student should be able to:

(a) Contribute to discussions on traditional uses of the sea
(b) Research the convict ships that brought some of our European ancestors to Australia
(c) Research the origin of some of our Australian Aboriginal Ancestors
(d) Write a report on a wreck
(e) Research famous navigators both European and Indigenous

Affective Objectives

The student should:

(a) Respect the traditional uses of the sea
(b) Admire the feats of early navigators
(c) Apprecite the differences in sea travel over time

Electives

Visit aboriginal middens, Model Ship building, Visit a Maritime Museum, Start a School Maritime Museum, Research famous voyages e.g. Kon Tiki, Salvage Contractors, Law of the Sea, Lloyds Contract - "No Cure - No Pay", Maritime Archeology e.g. Work Done on "Pandora" off Cooktown or a local wreck e.g. The "Young Australian" in Moreton Bay.

Unit 8: Coastal Studies (29 hours)

Many Queenslanders live within one hours drive of the sea. Many will spend their holidays at some type of coastal development. For schools that are on the coast, there is a special type of coastal environment which pervades the lifestyles of students. It is important for students growing up in this holiday atmosphere to realise the problems associated with it. Equally important is the problem of visitors to the coastal areas adopting codes of behaviour that are different to that of their normal lifestyle.

Content Objectives

The student should have knowledge of:

(a) General coastal features such as headlands, bays and beaches
(b) How waves are formed and affect the coast
(c) Coastal developments and engineering works (e.g. Groynes)
(d) Political implications of beach resource development
(e) Environmental implications of developing beaches, dunes or inland waterways
(f) The history of a local beach area
(g) Recreational activities that can be carried out on the coast
(h) Coastal disasters such as cyclones and floods and what to do when these occur
(i) Dangers associated with beaches and coastal bars
(j) Tides and their effects

Process Objectives

The student should be able to:

(a) Discuss different types of beach accommodation
(b) Compare different tariffs from different areas in Queensland (Lizard Island, Gold Coast)
(c) Collect information on different peoples attitudes to a local development
(d) Debate the information collected rationally
(e) Understand the rules and regulations associated with Beach Homes, Units, Time Sharing etc.
(f) Understand local council building regulations regarding cyclones and floods

Skill Objectives

The student should be able to:

(a) Construct a model wave tank to illustrate principles of beach erosion
(b) Illustrate with the model, the effects of groynes
(c) Use a phone book or newspaper or travel brochure to obtain tariffs for an area
(d) Plot a graph of tides over a month
(e) Go camping on the coast and as a result of this activity the students should be able to:
    (i) Demonstrate practical conservation methods
    (ii) Conduct a coast survey on a particular topic
    (iii) Catch, prepare and cook marine animals

Affective Objectives

The student should:

(a) Become receptive to different arguments for coastal development
(b) Become aware of the fragile nature of the coast and the effects of cyclones
(c) Appreciate the need to be careful while camping
(d) Develop a respect for the surf or sea
(e) Tolerate different developers opinions and criticise only when well substantiated facts are available.

Electives

Wave models and harbour design; Coastal jobs; Foreshore Ecology Project; Animals and Plants that inhabit the coast; Observe cyclone proofing on a construction site; study changes that have occurred in a local area because of management.

Unit 9: The Oceans (10 hours)

The activites of other countries will affect our seas because of the soluble nature of seawater and ocean currents. There are many who claim that the sea is an untapped resource and holds many riches in food, minerals and oil. Yet almost every sailor who travels the sea comments on how dirty they are becoming. Indeed they are humankinds unseen garbage dump and because of this are poorly managed. The law of the sea conferences cannot agree on who should own what and so it is up to all nations to develop a common policy. When this is finally developed this syllabus topic will be written in accordance with these policies in mind. Whatever the outcome, there is a need now to create a person who is aware of the social issues and is convinced that there is a way of dealing with these in a constructive manner. There also is a need to understand trade, and shipping. Studies of different trade routes and shipping technology are important.

Content Objectives

The student should have knowledge of:

(a) Local, State and Federal regulations with respect to waste disposal
(b) Materials commonly disposed of as waste into the sea
(c) Potential effects of marine pollution
(d) Techniques for detecting and monitoring pollution
(e) Seawater properties and ocean currents
(f) Natural resources of the oceans
(g) The effects of the sun, moon, earth system on the sea
(h) Potential energy sources of the sea
(i) Trade, ports and goods traded using the sea

Process Objectives

The student should be able to:

(a) Research living and non-living ocean resources
(b) Present a case in debate for a maritime policy
(c) Discuss the development of the seas resources
(d) Collate evidence of pollution of a local area, and from this predict the effect on the environment
(e) Develop a logical referenced argument concerning (c)
(f) Design a local study with the view to identifying and monitoring potential and or existing sources of marine pollution
(g) Consider the different elements of shipping and products exported

Skill Objectives

The student should be able to:

(a) Use laboratory equipment to measure pollution in a local area

(b) Use field equipment to collect water samples for study

Note: This may have already been done in Unit 5.

Affective Objectives

The student should:

(a) Value the need for good scientific data for accurate statements on pollution
(b) Develop a personal position in relation to pollution
(c) Appreciate how ports operate and how goods are transported overseas

Electives

Maritime law; Transportation; Naval Architecture; Trade; Effects of Nuclear Testing or wars; Research the oceans natural resources and how they can be extracted. Visit to a port to study the products being exported (sugar, coal, manufactures, grains, meat, etc.), studies of port handling and management. Consider the different elements of shipping (coastal, overseas, bulk), study different ship types, coastal surveillance.

UNIT 10: Boat Licence (20 hours)

This unit should be done near the end of the course when most students are over 16 and can legally obtain their Boat Licence. Once they have their licence they should be taken on an Excursion so that they can put their skills to use. Activities selected for the excursion will largely depend upon the emphasis you have placed on the various units. For example, an English teacher may decide to concentrate on Fishing whereas a Science teacher may wish to concentrate on Marine Technology. In any case the very fact that you go will be an education in itself. No objectives have been written for the excursion component due to this. They will be a combination of Units 1-9.

Content

The student should have knowledge of:

(a) the correct procedures on how to go about obtaining a boat licence
(b) situations including avoiding collisions at sea
(c) the buoyage system
(d) local regulations
(e) costs of registration
(f) skiing regulations
(g) speed limits
(h) the international diving flag
(i) navigation lights
(j) some sound signals used at sea
(k) skiing safety rules

Process

The student should be able to:

(a) apply knowledge into new situations
(b) predict the consequences of certain actions at sea

Skills

The student should be able to:

(a) check safety gear before departing
(b) connect a fuel tank to a motor
(c) push off and lower a motor
(d) start a motor and reverse out
(e) engage forward and handle a boat under power
(f) tie up at pilon with tide or current
(g) recover an object from water
(h) demonstrate the right-of-way on the water
(i) returning to shore correctly (motor off and up, idle in so as not to damage hull)

Attitude

The student should demonstrate:

(a) a generally safe and mature attitude
(b) observing speed limits and navigation aids
(c) avoiding collisions at sea
(d) mooring or anchoring a boat showing care for private property

7. LEARNING EXPERIENCES

7.1 *Matching the programme to the student*

Each unit is a resource package from which the teacher and/or the student can select an appropriate programme of activities. Ideally, each student should have his/her own unit programme. As this is often organisationally difficult we will begin with a three or four category classification of students. These categories could be used to form separate classes or groups within a class. For example groupings related to:

1. High academic ability
2. More able
3. Average
4. Least academically motivated

It is anticipated that a significant proportion of the students initially electing to study the subject will come from the latter group.

Least Academically Motivated Students (possible the majority of students)

In broad terms this population includes those students who for reasons of

(a) ability
or (b) cultural background
or (c) lack of motivation or interest
or (c) previous inadquate education (especially in the basic skills)

are technically not validly and reliably examinable using traditional assessment procedures.

Investigations into this area list the following common problems:

- Low motivation is frequently found in this group.
- These students are already conditioned to accepting lack of success in school studies.
- High absenteeism is quite common.
- Young and/or inexperienced teachers find these students most difficult to teach.
- Special assistance is necessary to help many teachers in the selection of suitable materials and classroom organisation and management.
- There is a general lack of suitable published material (texts, background readers, worksheets etc.). The interest level, content and presentation needs to be combined with appropriate readability.
- Some teachers have had to spend a disproportionate amount of time producing their own schemes and resource materials.
- The teaching groups tend to be too large. Because of the particular difficulties, investigations have suggested that a class size of 20 is a working maximum.

The implications for teaching appear to include the following:

1. Courses for the less able should relate to the students' daily experiences and future life.
2. Closer links should be developed between school, community and industry and commerce.
3. Opportunities given to develop more adult relations between older students and teachers.
4. Greater choice of areas of study for the students, e.g. modular studies.
5. Involvement of teachers in teaching basic skills implying co-operation among teaching staff and/or changes in pre-service teacher education programmes.
6. Greater emphasis on staffing and resources for teaching less able students in each secondary school.

However, since it is envisaged that the subject will be relevant to all students, provision will be made for a program suitable for the other groups identified earlier. That provision is based upon considerations such as the following.

The Most Able Students

Programmes for these students should include the basic objectives for the module and in addition activities which either provide a broader coverage or further study in depth. Open-ended activities, mathematical approaches and/or independent study are some examples of additional activities which could be used. Teachers might develop a number of hand written instruction cards or guideline sheets so that these students can further develop areas of learning such as independence in study, experimental design, synthesis of ideas, development of appropriate equipment to investigate a problem, higher level problem solving etc.

In some cases the materials produced by the most able student could be used by the rest of the class e.g. an instruction card, a slide/tape presentation, a lecture by the student etc. These and other activities can both help the class and the most able student's personal development.

7.2 *Learning Experiences*

In order to most effectively meet the developing needs of all students, learning experiences should be co-ordinated so that there is a planned progression from the simple to the more complex. Increasing demands should be made upon students to plan and carry out procedures to solve problems and make decisions.

Therefore learning experiences could include

1. using a chart to navigate
2. going out in a boat to apply principles learned in class
3. discussing results from excursions
4. operating equipment such as sails, knots, instruments
6. designing experiments
7. making equipment
8. swimming and diving in the sea using the appropriate equipment
9. catching fish and cooking
10. participating in work experience
11. organising a work shop and other resources
12. performing tasks to a mastery level
13. using research techniques
14. participating in panels and discussions
15. interacting with speakers
16. presenting oral reports
17. compiling a folio of information
18. sitting for tests e.g. Boat Licence, Radio Licence, Bronze Medallion, Surf Bronze.

8. DEVELOPMENT OF AN ASSESSMENT PROGRAMME

Assessment is discussed under 4 headings:

8.1 Introduction

8.2 Assessment Techniques

8.3 The Nature of the Units

8.4 The Components and Assessment

8.1 Introduction

In this subject assessment is defined as the progressive gathering of information about the performance of individual students. Summative assessment is the final judgement of each student's achievement of the syllabus objectives as expressed in the school's work program. This final judgement is made from an analysis of selected items from the total assessment data gathered throughout the entire course of study. It should be remembered that the majority of these students are non tertiary bound.

The roles of assessment are: (in order of importance)

1. to enable students to assess their learning, and to provide information which can be used to correct deficiencies.
2. to enable teachers to modify their teaching to better suit the needs of the students.
3. to provide students and parents with information concerning the student's achievement.
4. to assist students and parents in determining future education and employment pathways.
5. to provide, for other educational institutions and for employers, an indication of the suitability and readiness of students to undertake further education or employment.

8.2 Assessment Techniques

There are a variety of techniques used to assess students. This subject is intended for non tertiary bound students and it is important therefore, to develop a realistic evalution programme. Students from this course will more likely be asked to perform tasks rather than write about them. A more accurate evaluation of the student's ability will therefoe come from emphasis on Performance Testing. Therefore the major component of the school assessment programme will consist of performance testing procedures.

(a) The Performance Component

(i) Performance Tests

In the main this type of test is a more personal one between examiner and individual student. Such tests can measure achievement in all areas of objectives. The student can be asked to perform manipulative skills and while doing these can be asked oral questions about the content and process area of the course. From the way the student performs in the test the examiner can also assess the attitude of the student. In some cases group testing of skills could be employed but care will be taken not to test too many students at once. This type of test is usually more reliable.

Examples of performance tests include:

- Individual practical testing : e.g. knots, boating skills or snorkeling, taking bearings ...
- Group practical testing : e.g. plotting a course from given information, making calculations ...

To facilitate the aim of performance tests, a certain component of the test may be written. For example 'plotting a course' could be a written performance test. Slides and videos simulating sea conditions might be used to test the performance area.

As a result of performance testing, the student should be more able to cope with everyday situations e.g. obtaining a licence. Thus this type of assessment is seen to play a part in the attainment of life roles.

(ii) Teacher Checklists

Observation of student behaviour throughout the course of study can provide information to supplement that derived from formal tests. In addition it may provide information not available from other sources, e.g. practical skills, attitudes.

Assessment through observation is facilitated by the use of prepared checklists in which the teacher has identified and communicated to the students those objectives of the total programme which are to be considered. Over a period of time each student will be observed with regard to a selection of identified objectives. Several such observations throughout the course of study are used in making a final judgement. In this way a more reliable assessment can be made, and this will contribute to the global statement of student achievement.

(b) The Written Component

(iii) Written Tests

Written tests (e.g. multiple choice, true/false, matching, short answer, extended answer) can be used to gain information about the achievements of content and/or process objectives either separately or in conjunction.

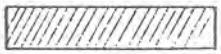
(iv) Assignments

The use of assignments (e.g. library research, projects, writing up of reports or field trips) can also provide information about the achievement of content and process objectives. In addition, projects involving the construction and use of equipment may provide information in the area of skill objectives.

3.3 The Nature of the Units

The spirit of the units is one of relevance and lifetime practicability; (e.g. the boating skills should last for a lifetime). Some topics are more practical then others. Performance tests should be applied to the more practical topics. The workbook is designed so that over 70% of core topics are practical. The table below illustrates the relationship between topics and intended testing components. This may be varied during the course in order to ensure that an appropriate relationship is maintained between time weighting in teaching theory and practice, and the test components.

TABLE 1: Relationship between Syllabus Unit and Suggested Test Component

 indicates performance component of test

 indicates written component of test

Unit	Time	Performance component / Written Component
1. Navigation	20 hrs	
2. Boating	45 hrs	
3. Swimming & Diving	15 hrs	
4. Commercial & Recreational Fishing	30 hrs	
5. Marine Technology	29 hrs	
6. Marine Resources Value & Management	12 hrs	
7. Marine History	10 hrs	
8. Coastal Studies	29 hrs	
9. The Ocean	10 hrs	
10. Boat Licence	20 hrs	
	220 hrs	

8.4 *The Components and Assessment*

A. Performance

B. Written

C. Testing Programme Summary & Exit Level Criteria

A. The Performance Component

Major emphasis will be placed on assessing Student performance in Units 1-4.

- In this component a check list or performance test will be given
- The performance component will test content, process and skill
- Each student will practice the subject matter in the course then be tested individually or in a small group
- Each student will be given a chance to repeat the performance test
- Examples of the criteria for each unit test follow.
- A student who could be at sound level may demonstrate some of the following depending on your exit level criteria.

TABLE 2 POSSIBLE CRITERIA FOR SOUND ACHIEVEMENT - PRACTICAL ELEMENTS

A student with sound level of achievement may demonstrate some of the following according to the emphasis you have placed on each unit.

Performance Test Criteria: UNIT 1: NAVIGATION

1. Answer questions correctly on general navigation equipment
2. Use instruments correctly
3. Take bearings at sea accurately
4. Make simple calculations at sea
5. Can steer a compass course at sea
6. Knows 'rules of the road'
7. Answers questions on Tides correctly
8. Relates weather forecasts to expected sea conditions
9. Knows systems of Bouyage

Performance Test Criteria: UNIT 2: BOATING

1. Correctly answers questions relating to boating terms.
2. Ties knots to satisfactory standard
3. Able to mix fuel, and uses lubricants correctly
4. Takes all necessary safety precautions
5. Able to start motor and handle craft under power confidently
6. Sails boat correctly using wind to best advantage
7. Uses trailer well and knows maintenance
8. Can identify dangerous situations and weather forecasts
9. Displays courtesy and respect for other people's property
10. Knows how to buy a boat

Performance Test Criteria: UNIT 3: SNORKELING

1. Adjusts face mask, flippers, gear and snorkel accurately
2. Safely enters the water with gear on
3. Fin for 100m satisfactorily
4. Dives correctly and clears ears
5. Performs mouth to mouth resuscitation and external cardiac massage
6. Swims 200m
7. Writes underwater
8. Able to rescue from water satisfactorily
9. Displays knowledge of dangerous conditions
10. Able to get into a boat from the water

Performance Test Criteria: UNIT 4: FISHING

1. Sets up a fishing rig for fish
2. Catches a fish
3. Guts, cleans, fillets and cooks a fish
4. Accurately uses a book to identify fish caught
5. Uses a book to obtain legal size
6. Maintains an aquarium
7. Locates a Habitat Reserve on a chart.

B. The Written Component

Some criteria for this component are that the student be able to:

spell words correctly, select appropriate alternatives in multiple choice questions, select relevant content and answer questions logically and systematically. When objectives are reassessed in this component an improved student performance should be given credit. For example, in navigation, if a student's ability in performing a task improved over time then the later assessment would be taken.

Table 3 shows some of the Criteria which may be used to judge student achievement in the Applied Elements.

TABLE 3: POSSIBLE CRITERIA FOR SOUND ACHIEVEMENT - APPLIED ELEMENTS

A student with sound level of achievement may demonstrate some of the following according to the emphasis you have placed on each unit.

Test Criteria: UNIT 5: MARINE TECHNOLOGY

1. Constructs and demonstrates a device which will sample water under water at a predetermined depth satisfactorily
2. Operates a burette or balance and/or microscope effectively
3. Uses a device to measure some non-living parameter in the environment (e.g. depth sounder)
4. Identifies a variety of instruments and matches them to a particular task
5. Records data accurately and completes written reports to a satisfactory level.

Test Criteria: UNIT 6: MARINE RESOURCES

1. Applies for a permit in writing by locating appropriate authority, writing and posting letter to a satisfactory standard
2. Behaves in a way that is consistent with the regulations of a selected area
3. Answers questions correctly on written test
4. Reports on management authorities accurately.

Test Criteria: UNIT 7: MARINE HISTORY

1. Demonstrates use of a Library Catalogue satisfactorily
2. Write a letter seeking research information accurately
3. Write's short assignment accurately
4. Keeps folio accurately.

Test Criteria: UNIT 8: COASTAL STUDIES

1. Uses a phone book, newspaper or pamphlet to obtain rent, tariff and information facilities on Coastal accommodation to a satisfactory standard
2. Given a model of a coastline, points out the effects of certain engineering structures on sand movements
3. Debates an issue on a proposed coastal development in a convincing manner.

Test Criteria: UNIT 9: THE OCEANS

1. Keeps a newspaper folio on ocean features, research and laws of the sea
2. Uses laboratory equipment to detect pollution; satisfactorily measures oxygen concentration accurately
3. Uses field equipment to monitor pollution accurately.

Note: These are suggested criteria and will be modified each year with updating of the course and are to be refined according to the school programme and individual teachers performance.

Test Criteria: UNIT 10: BOAT LICENCE AND EXCURSION

1. Successfully obtains boat licence
2. Plans and carries out marine excursion satisfactorily
3. Successfully puts into operation most of what has been put into use in the course.

C. TABLE 4: POSSIBLE ASSESSMENT PROGRAMME SUMMARY

GRADE	UNIT	TEST	
11	1. Navigation	Performance Test 1 (10 mins) Written test (30 mins)	15 marks
	2. Boating	Performance Test 2 (30 mins) Written test (1 hr)	30 marks
	3. Swimming & Diving	Performance Test 3 (30 mins) Written test (30 mins)	25 marks
	4. Fishing	Performance Test 4 (10 mins) Written test (30 mins)	30 marks
			100 marks
12	5. Technology	Units test Reports	15 marks 30 marks
	6. Resources	Unit 6 test Reports	30 marks 30 marks
	7. History	Unit 7 assignment	25 marks
	8. Coastal Studies	Unit 8 test	15 marks
	9. The Oceans	Unit 9 test	10 marks
	10. Boat Licence	Written & practical test Unit 10	20 marks
	1-4	Rescheduling of Performance Tests if required	200 marks

8.5 *Suggested Exit Level Criteria (from a profile over 2 years)*

VERY HIGH LEVEL: The student will have achieved 85% ± x% of performance test objectives, and passed * the written components of the course.

HIGH LEVEL: The student will have achieved 70% ± X% of performance test objectives and passed the written components of the course.

SOUND LEVEL: The student will have achieved 50% ± X% of performance test objectives and passed the written components of the course

LOW LEVEL: The student will have achieved 30% ± X% of performance test objectives and passed the written components of the course.

VERY LOW LEVEL: The student will have achieved less than 30% ± X% of performance test objectives and failed the written components of the course.

Note: "X" is a number between 1 and 7 depending on the quality of the performance, ± test objectives at the time, the standard of the written components, and allowing for any unforseen circumstances.

* A pass on the written component shall be 50% ± X

A student may sit for a Performance Test again.

8.6 *Global Assessment* *(Some Suggestions for a School Report Card)*

(a) The student global assessment will be in one of five categories -

Very High Achievement
High Achievement
Sound Achievement
Limited Achievement
Very Limited Achievement

(b) The student global assessment might be expressed in terms of -

- demonstrated knowledge of facts
- demonstrated understanding of procedures,processes, systems and methods
- demonstrated understanding of concepts and principles
- demonstrated ability to complete, plan, make decisions, solve problems
- demonstrated ability to take responsibility
- demonstrated self reliance and confidence
- demonstrated technical skills

(c) Typical of the Keywords which may be used to indicate different levels of achievements are:

Very High:	Consistent, almost always, Advanced, Very High, Highest, Exceptionally, Very Deep Insight
High:	Frequent, Significant, Mostly High, Deep Insight
Sound:	Routine, Basic, Reasonable, Satisfactory, Proficient, Some Insight, Sound
Limited:	Occasionally, Some, Unsatisfactory, Little, Ineffeciently, Inappropriably, Haphazardly, Limited
Very Limited:	Inconsistently, Very Little or No, Minimal, Unable To, Exhibit Great Difficulty, Showed Little Evidence of, Very Limited.

9. RESOURCES

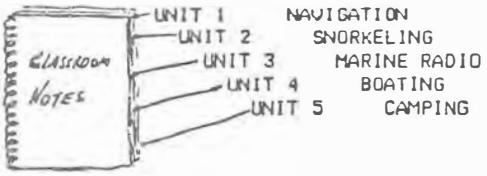
9.1 Text Resources

Student Notes: Available the Publications Officer
Brisbane South Regional Marine Studies Project
c/- Benowa State High School
Mediterranean Drive , Benowa, Qld, Australia 4125
PO Box 5733, Gold Coast MAil Centre, Bundall

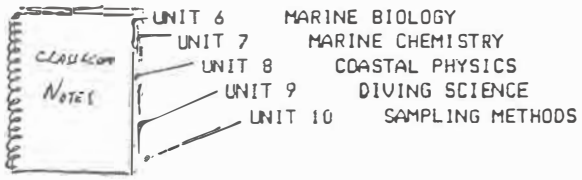
Our aims are to provide schools throughout Australia with:

(a) Marine Studies notes suitable for Classroom Use
(b) Sample R.O.S.B.A. work programmes that match these notes
(c) Specific Objectives that your students can use to pass your examinations
(d) Examination papers that match specific objectives and work-programmes
(e) Excursions that link workbook sections together and make learning more meaningful
(f) 2/3 hourly block programmes to suit extended timetabling
(g) Information on TAFE / Sec Marine Studies programmes
(h) A Syllabus document that can act as a "springboard" for other ideas.

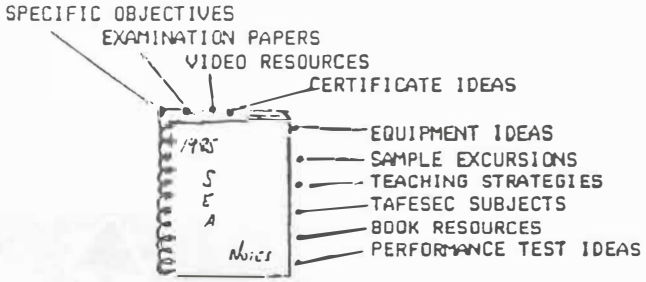
Classroom Notes with a Practical Emphasis:



Classroom Notes with a Applied Emphasis:



Workbook S.E.A. Notes for your Marine Studies Co-Ordinator



9.2 Marine Centres

To save money schools doing the course should be encouraged to share resources. If sharing networks can be set up then resources such as expensive navigation instruments could be shared amongst a number of schools.

Other resources such as boats, fishing rods, snorkelling gear, canoes, surfboards should be borrowed or a sharing of network set up.

There are 2 field study centres that specifically cater for marine studies in Queensland:

Boyne Island Field Study Centre	Jacobs Well Field Study Centre
c/- Boyne Island,	M.S. 33
Via Gladstone, Q. 4680	Beenleight, Q. 4207

Schools are encouraged to contact the Officer-in-charge. Jacobs Well is building a 9.2m trawler and has a 3.2m runabout; Boyne Island has a 3.4m runabout.

The Darling Point Special School has a 10m Diesel Powered Motor Vessel. The school is alos well equipped with a variety of runabouts, windsurfer and sailing boats. Schools are interested should contact:

The Principal
Darling Point Special School
The Esplanade
Manly, Q. 4179

Two schools are teaching significant portions of the syllabus and have accumulated some resources. Schools should contact the Principal.

Benowa State High School	Gladstone State High School
P.O. Box 5733 G.C.M.C.	P.O. Box 260
Benowa, Q. 4215	Gladstone, Q. 4680

The Maroon Outdoor Centre has a wealth of knowledge on boating and sailing. Interested teachers should contact:

The Principal
Maroon Outdoor Education Centre
M.S. 488
Boonah, Q. 4310

9.3 *Equipment*

The following is an attempt to establish firstly the mininum equipment with which the syllabus can effectively be operated and secondly the desirable basic equipment for the course involving 20 students. For each extra 10 students, the desirable basic equipment should be increased by one item. Where funds are limited, the possibility of borrowing equipment should be investigated and using members of the community as resources. The implementation guide has many useful suggestions.

UNIT 1 Navigation

(a) Minimum: Access to charts, navigation aids and a boat where skills can be put into practice.

(b) Desirable Basic: 10 of each of the following: chart of local waters, hand bearing compass, parallel rules and divides.

Note: If other navigation aids can be borrowed then it will add more meaning to the course such as: sextant, ships log, marine compass, barometer, chronometer. All these could be demonstrated on a visit to a shipyard.

UNIT 2 Boating

(a) Minimum: Access to (5 x 3m dingies) or (4 x 3.6m dingies) with associated equipment as listed below). Life jackets for 20 and a trailer.

(b) Desirable Basic: 5 of each of the following: 3m aluminium dingy, 5 hp outboard motor and tank, anchor, chain and rope, tool sets, cleaning, maintenance and fishing equipment, storage equipment.

Note: Benowa State High School has a model workshop and boating unit prepared and has copies of a Full Equipment List.

UNIT 3 Swimming and Diving

(a) Minimum: Access to pool and snorkeling equipment. If this unit is done in winter you should consider wet suits.

(b) Desirable Basic: 20 of each of the following: snorkels, face masks and flippers. 1 of each of the following: manakin, signal flags, surfcraft, oxyviva. (optional)

Note:

(1) Surfboards and surf craft are specialized gear and usually require a long time to master. Surfboard riding takes about 2 years, on a regular basis to master and schools should be wary of equipment purchased and tailer the course to local needs.

(2) Scuba is ILLEGAL unless taught by a qualified instructor. Schools should consider this and if suitable instructors are found, negotiate reasonable rates. $70 is a starting figure for a group of 7 but could be reduced or subsidised by P&C, local interest groups.

UNIT 4 Recreational and Commercial Fishing

(a) Minimum: Access to fishing gear and equipment. Students should be encouraged to make a crab pot and could be part of a manual arts project. Once the fish were caught, they could be prepared as part of a Home Economics project thus reducing the equipment necessary.

(b) Desirable Basic:

20 of each of the following: fishing creel, fishing rod and assorted tackle, knife, cutting board, bait, ice and storage containers.

Note: Type of gear will have to be suited to locality intended for the educational exercise. Schools should seek advice from local fishing clubs or sports shops.

UNIT 5 Marine Technology and Research

(a) Minimum: Access to a Science Laboratory would be considered basic to this unit along with access to laboratory equipment and computers (if at all possible).

(b) Desirable Basic: 8 of each of the following: laboratory balance, burette, associated glassware and equipment (burners, tripod stands, beakers, etc.).

20 of each of the following: materials necessary to make a water sampling device desinged by the students (with guidance) e.g. old wine flagons, sinkers, weights, rope, corks, etc. should be collected as the student can design his/her own piece of technology.

1 of each of the following: digital PH meter, conductivity kit, oxygen meter, milligram balance, colorimeter, camera.

Note: Check with the Science Department as to what equipment is available. Depth of treatment will largely depend on the teacher's own depth of knowledge as well as resources available. Care should be taken before purchasing valuable technical instruments. Also read the Implementation Guide.

UNIT 6 Marine Resources: Value and Management

Access to a video and monitor could be of great use along with selected video programmes about the sea.

UNIT 7 Marine History

Allowance should be made to either visit a wreck or run an excursion to a local Maritime Museum. The cost of the bus hire or boat hire should be budgeted for. A school Maritime Museum could also be studied in consultation with a local Historical Society.

UNIT 8 The Coast

(a) Minimum: Allowance should be made to take students camping on the coast. Ideally it should be at the end of the course where students could pack their boat with camping gear and go surviving for 2-3 days on a offshore island. For this allowance should be made for camping equipment.

(b) Desirable Basic: 6 of each of the following: tents, flys, stoves, cooking gear, storage containers and other miscellaneous items necessary for camping.

UNIT 9 The Oceans

Access to a video and monitor and a good selection of general tapes. Computer simulation games could be purchased for this unit however, there is no specialized equipment envisaged.

UNIT 10 Boat Licence and Excursion

(a) Testing Officer cost $10 (b) The Licence Cost $15. Both could significiantly be reduced if (a) could be a parent who would donate his or her time and (b) could be donated by the P. & C. as a school incentive at the end of the course. For the licence, Unit 2 describes the resources necessary. Elements of the other units would be used extensively because the aim of this unit is one in which all the skills from the previous units are applied. Consult equipment lists for the units you select.

10. Safety in programmes using water-craft

The following is the EOC statement on Water Safety

"Schools desiring to implement programs or activities involving water-craft should ensure that the following guidelines are observed:

10.1 Responsibility of the Principal

(a) The principal must obtain the approval of the relevant Regional Director of education for the program to operate in the school. Applications for approval should nominate the type of craft to be used; the area of use; the anticipated dates and times for use; and the number and names of student who it is anticipated will be involved.

(b) The principal must nominate the teacher-in-charge of the program. Prior approval must be obtained from the Regional Director of education if this teacher is to be replaced by another teacher.

Note:

The operator of the boat need not be a teacher, but should be a person selected for expertise and experience in this particular field and a person who is willing to work in conjunction with the teacher-in-charge. Knowledge of weather signs; knowledge of local tide and water conditions; ability to perform emergency reparis to equipment; and procedures involving first-aid treatment and resuscitation should be expected competencies to be held by the teacher-in-charge of the teacher's assistant.

(c) The principal must ensure that insurance provisions are adequate and that the teacher-in-charge and the boat operator are aware of their liabilities.

(d) The principal must ensure that for excursions involving monies and in which a number of students are riding in one vessel, the operator holds a launch master's licence and that the vessel has a current certificate of survey.

(e) The principal must obtain written approval from a parent or guardian for each child participating in water-craft activities.

(f) Approval for the overall water-craft program to be implemented in a school must be obtained from the parents and citizens association.

(g) The principal must ensure that all water-craft and trailer equipment are well maintained and that programs include instruction in the care and maintenance of such equipment.

(h) The principal must approve a code of general rules and safety rules, emergency procedures and behavioural expectations for students engaged in water-craft activities. This plan should be endorsed by the parents and citizens' association and should be submitted to the relevant Regional Director for approval.

10.2 Responsibilities of teacher-in-charge

(a) The teacher in charge should prepare a check-list of items to be observed prior to the activity. These should include:-

(i) a record of date; time of departure; area to be visited; expected time of arrival back at school; roll of students; and roll of adults to be handed to the principal prior to leaving school;

(ii) water-craft safety inspection;

(iii) safety equipment check;

(iv) fuel and water inspection;

(v) student life jacket and dress inspection;

(vi) student briefing on safety and emergency procedures; and

(vii) water-way hazard and obstacle check.

(b) Water-craft activities should be undertaken only when weather and water conditions are favourable. The rule "When in doubt - don't go out" should be strictly applied.

10.3 *Solo-operated Craft*

(a) Every water-craft should be individually inspected prior to launching.

(b) The pick-up boat should be the first craft launched. All persons on board the pick-up boat must wear life jackets at all times.

(c) The teacher in charge must be competent to effect the rescue of a student in difficulty and must therefore be wearing appropriate clothing.

(d) Students should be trained not to stray from the group when on the water.

(e) Life jackets or buoyance vests must meet with Australian Standards Association requirements and must be worn at all times.

10.4 *Water-craft equipment*

(a) All water-craft and associated equipment for use with school children must meet the requirements of the Navigation (Equipment of Pleasure Yachts) Regulations of 1971 made in pursuance of the provisions of the Queensland Marine Act 1958-1967. Copies of the regulations are available from any office of the Department of Harbours and Marine.

(b) Water-craft should:

(i) be of the appropriate type for the waterways involved;
(ii) contain sufficient in-built buoyance, in the form of sealed air cases or other durable buoyant material, to support the total weight of the loaded vessel in the event of its filling with water;
(iii) carry loadings strictly in adherence with the manufacturer's specificiations; and
(iv) be fitted with motors of appropriate power according to design specifications.

(c) Water-craft must be equipped according to the Navigations Regulations. These are summarised in the current Department of Harbours and Marine Boating and Fisheries Patrol pamphlet Safety equipment (Pleasure Yachts).

(d) The parents and citizens' association must signify willingness to accept responsibility for payment of all operating costs, registration of boats and trailers, insurances, maintenance and repairs of equipment associated with the program before the application for approval is submitted to the relevant regional director. Registration of boats and trailers is to be in the name of the Minister for Education.

(e) Where possible, it is desirable to work in conjunction with local water-craft clubs."