



Level 4

Teacher Resource Book



Anna Cooke

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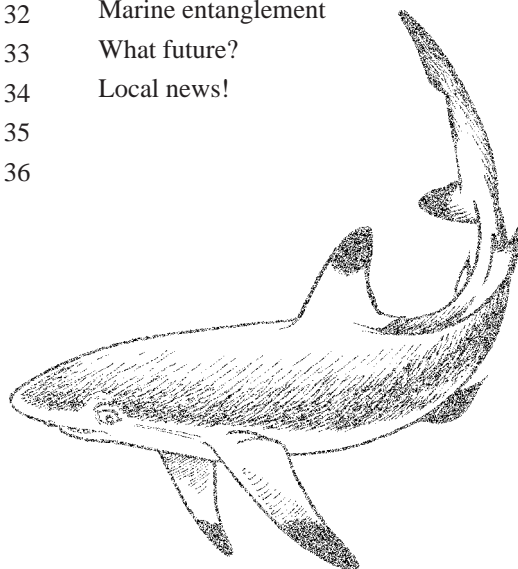
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About this resource book

The following suggested activities, blackline masters and worksheets are for use with the Kids and Water marine reader series Books 13 to 18:

Book 13: Let's Go Sailing

Discover what fun a sailing lesson can be and learn about the different parts of a sailboat and what they do. In this book two students, who are keen to learn to sail, go for their first sailing lesson.

Book 14: Food from the Sea

So much food we eat comes from the sea! There are many different ways that we collect food from the sea and many different types of food that come from the sea. This book will show you some of the diversity of seafood, ways we eat it and why we shouldn't eat some seafoods.

Book 15: Classification and Survival

Sea creatures have some bizarre adaptations to enable them to survive in an environment that we could not survive in. This book covers interesting information about the common characteristics and features some sea creatures have and why they belong to particular groups as well as exploring some of the adaptations that enable them to survive.

Book 16: Sea Creatures at Risk

All sea creatures are at risk when the sea is their home. Find out about some of the risks to sea creatures. Are we responsible in any way? Is there anything we can do?

Book 17: Better Boating Behaviour

Going on any type of boat across the water is fun! There may be dangers we are not aware of and some simple safety knowledge and equipment could save lives. Learn about the different types of safety equipment and how to use them.

Book 18: Don't Mess with the Sea

When we mess with the sea we mess with our future! Why is so much pollution entering the sea? What effect is it having on the sea creatures and people? How does it get there and where does it come from?

Each book has eight activities. The KLA and learning outcomes for each activity are summarised at the start of each section. Focus questions and ideas for introducing the topic of the book before and after the reading are suggested at the start of each section.

Why marine education is important

If you could travel into space and look back at our earth you would understand why it might be called the Blue Planet! The oceans of the world are rich and valuable environments. They are filled with some of the most amazing, fascinating and bizarre creatures, plants and geological features. The oceans cover 71% of our earth's surface, contain most of the life on earth and produce most of the world's oxygen!

The oceans are in danger. Oil spills, rubbish dumping, overfishing, erosion, habitat disturbance and a host of human activities are all severely affecting our Blue Planet.

Many young people are interested in preserving the oceans. The sea is more than just a nice place to visit; it is a major part of our life support system.

What we do each day and how we use and care for the land will affect the health of the oceans. We are all connected to the oceans in some way.

Through education we can create student awareness, influence attitudes and encourage action, to support our marine and coastal environments.



Book 13

Let's go Sailing

Before reading the book

- Discuss who has been sailing before? What type of sailboat was it? What happened? Was it fun?
- Ask students to bring any photos of their experiences to school.

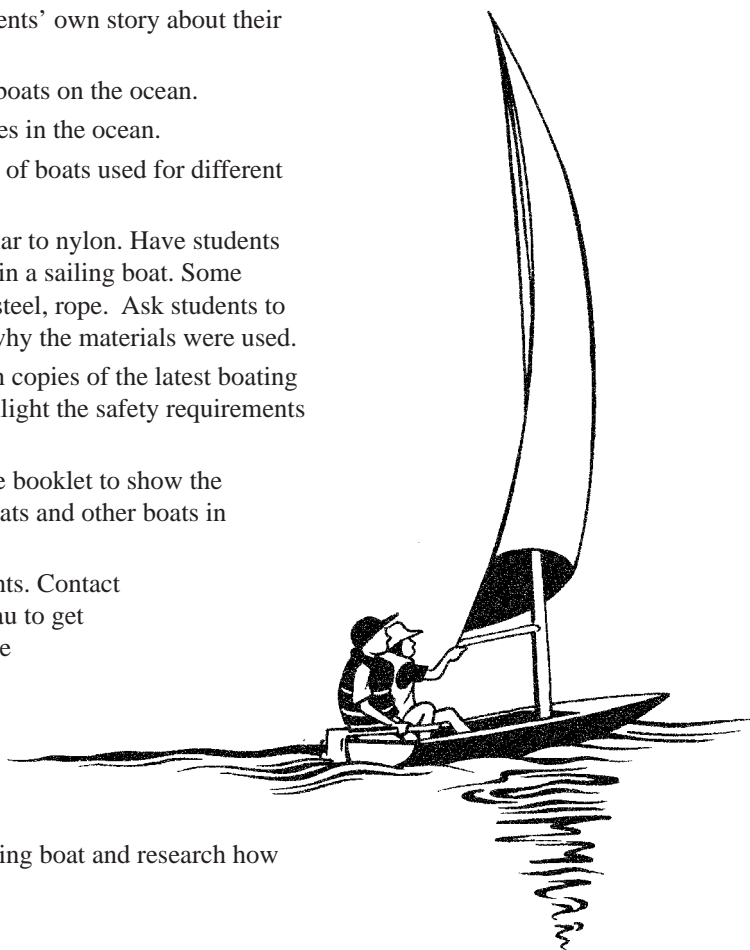
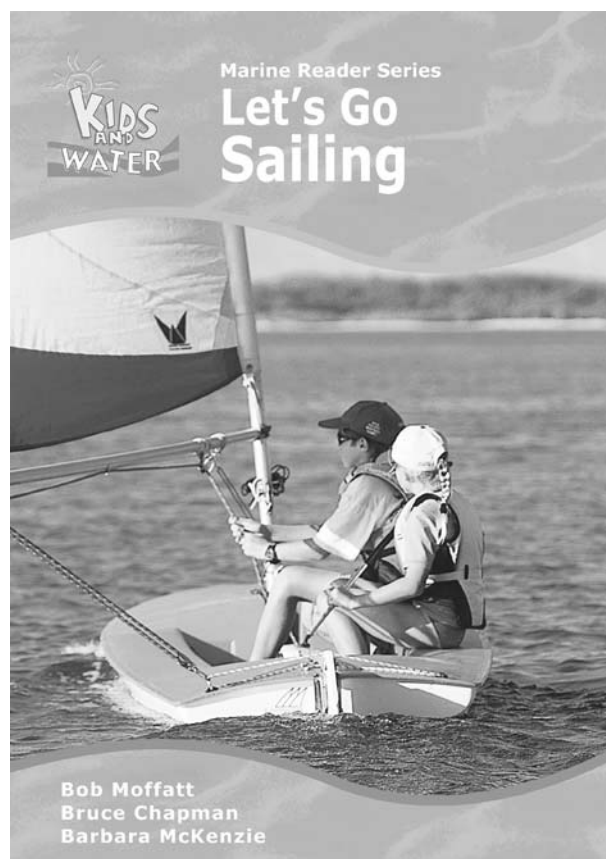
After reading the book

- Discuss the use of the language in the text.
- Use the index to define and understand the use of new terminology.
- Relate to the students' experiences of sailing.

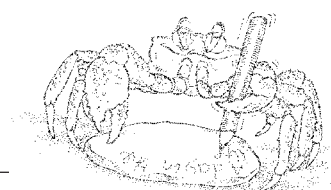
Other suggested activities

The Australia and New Zealand Safe Boating Education Group (ANZSBEG) has a website with relevant activities at www.anzsbeg.org.au

- Take the class for a sailing lesson.
- Invite a sailor to speak at school.
- Write a song about sailing.
- If you are going on a school camp, see if you can incorporate sailing into the program. Follow your school workplace health and safety program.
- Use the reader as a template to write the students' own story about their sailing lesson.
- Compare the impacts of sailboats and motor boats on the ocean.
- Find out what effect the wind has on the waves in the ocean.
- Use old boating magazines to observe shapes of boats used for different purposes.
- Many materials are used in sailing, from kevlar to nylon. Have students make a collection of different materials used in a sailing boat. Some materials could include fibre glass, stainless steel, rope. Ask students to draw up a table to summarise their ideas on why the materials were used.
- Write to your state boating authority to obtain copies of the latest boating rules and regulations. Use the booklet to highlight the safety requirements for sailing boats.
- Find out about lights on sailing boats. Use the booklet to show the difference between lights carried on powerboats and other boats in the sea.
- Make a model sailing boat and put on the lights. Contact your ANZSBEG web site www.anzsbeg.org.au to get the addresses of local transport offices for free brochures.
- Find out about famous sailing races such as the Sydney to Hobart. Use a map of Australia to plot their courses.
- Use a map of Australia to plot the course of Mathew Flinders. Find a picture of his sailing boat and research how different it is from today's sailing boats.



Learning outcomes



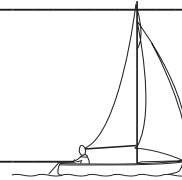
Activity	KLA	Outcome
1 Let's go sailing - p3	English	READING AND VIEWING – 4.5 Justifies own interpretation of ideas, information and events in texts containing some unfamiliar concepts and topics and which introduce relatively complex linguistic structures and features. WRITING – 4.9 Uses
2 What knot - p4	English Health & PE	READING AND VIEWING – 4.5 Justifies own interpretation of ideas, information and events in texts containing some unfamiliar concepts and topics and which introduce relatively complex linguistic structures and features. HUMAN MOVEMENT – 4.3 Performs and repeats linked movement sequences that display consistency and control.
3 Mini boats that float - p7	Technology	DESIGNING, MAKING AND APPRAISING – 4.3 Organises and implements production processes to own specifications, recognising hazards and adopting safe work practices. 4.4 Assesses the effectiveness of own designs, products and processes in relation to design requirements, including social and environmental criteria.
4 Boat parts - p8	English	READING AND VIEWING – 4.8 a Selects, uses and reflects on strategies appropriate for different texts and reading or viewing purposes. WRITING – 4.9 Uses writing to develop familiar ideas, events and information.
5 Sailing lessons - p9	Health & PE The Arts	PHYSICAL ACTIVITY AND THE COMMUNITY – 4.6 Plans strategies to promote participation in recreational activities. DRAMA 4.6 Experiments with ideas and explores feelings to find satisfactory solutions to tasks.
6 Survival kit - p10	English Health & PE	SPEAKING AND LISTENING – 4.1 Interacts confidently with others in a variety of situations to develop and present familiar ideas, events and information. Safety – 4.12 Assesses options and consequences in responding to unsafe situations.
7 Jelly windsock - p11	Mathematics SOSE	MEASUREMENT – 4.19 Measures and makes things, using conventional units and measuring equipment for length, mass, capacity and angle and reading scales to the nearest marked graduation. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
8 What happened - p12	English Health & PE	READING AND VIEWING – 4.5 Justifies own interpretation of ideas, information and events in texts containing some unfamiliar concepts and topics and which introduce relatively complex linguistic structures and features. SAFETY – 4.12 Assesses options and consequences in responding to unsafe situations.

Name: _____

Lets go sailing!

1. What does rigging the boat mean?

2. What is the mainsheet for?



3. How do the centreboard and the rudder help when you are sailing?

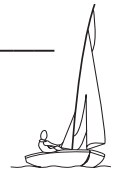


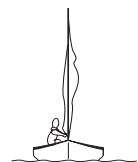
4. Which side is always the windward side?

5. Organise the words in the list into pairs that are related.

Write a short sentence to explain how they are related.

mast, tiller, rudder, sail, mainsheet, boom











Name: _____

What knot?

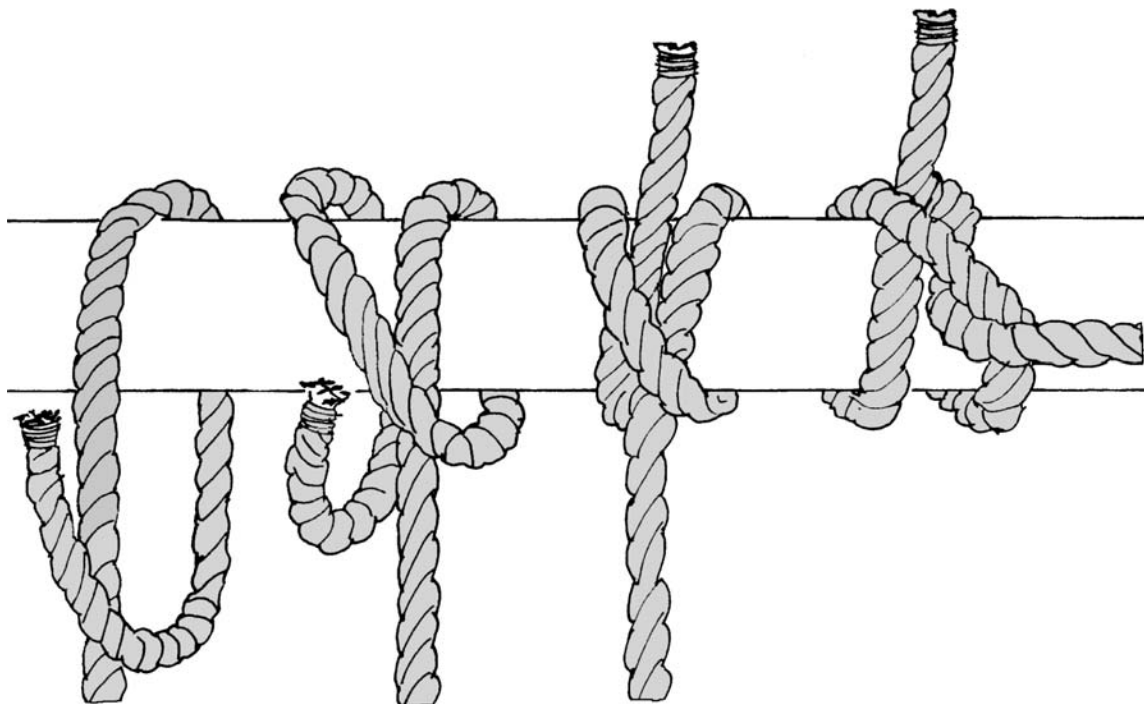
Knowing how to tie a special knot can be very helpful in many situations!
Practise these two knots

1. Half-hitch - can be used for tying many things including tying a boat up to a jetty.
2. Bowline – used when a line is required to be secured through or around something, e.g. tying equipment in a boat or making a loop for a mooring.

A half hitch

To make a half-hitch you will need to practise on a pole or similar object as shown in the diagram below.

1. Wrap the end of the rope around the pole.
2. Bring one of the ends through.
3. Repeat this process.
4. Pull the knot tight.



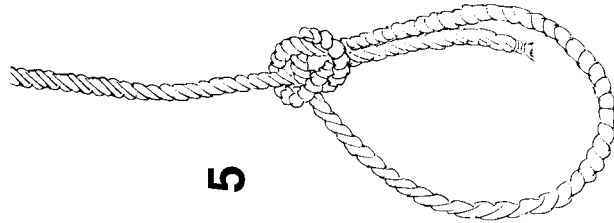
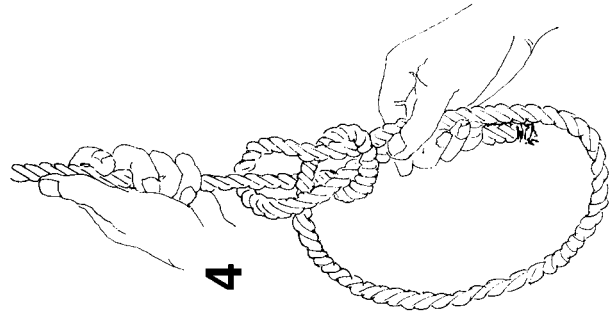
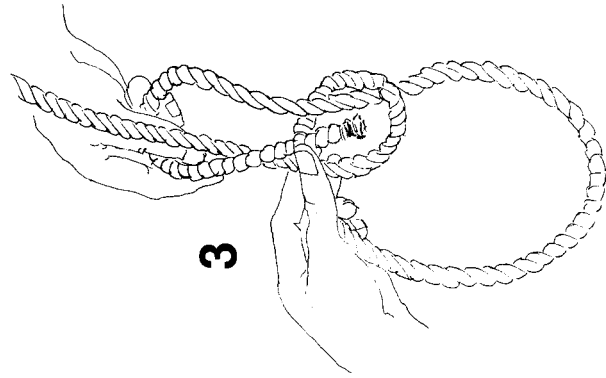
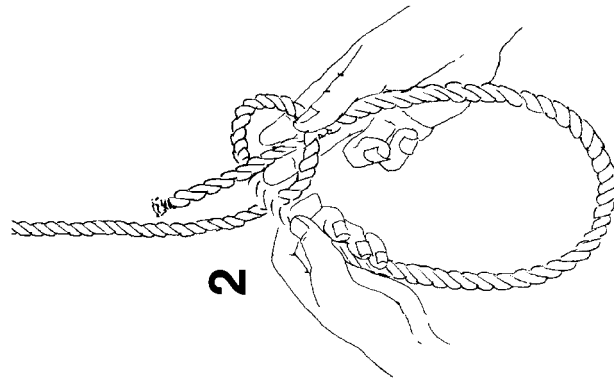
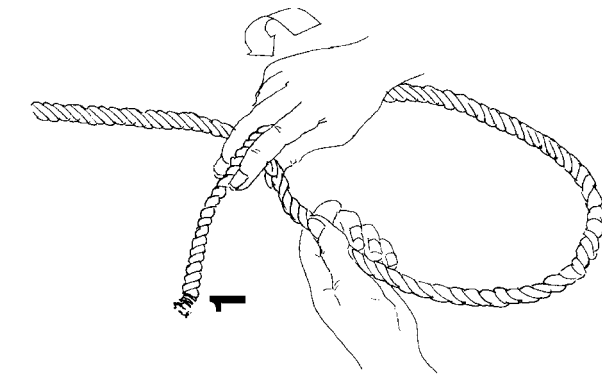
Bowline knot

To keep it simple we will refer to the knot using the words, tree, a rabbit and a rabbit hole.

The loop you make will be the rabbit hole and the end of the rope the tree around which the rabbit runs.

Follow the pictures below to help you (pictures numbered 1-5)

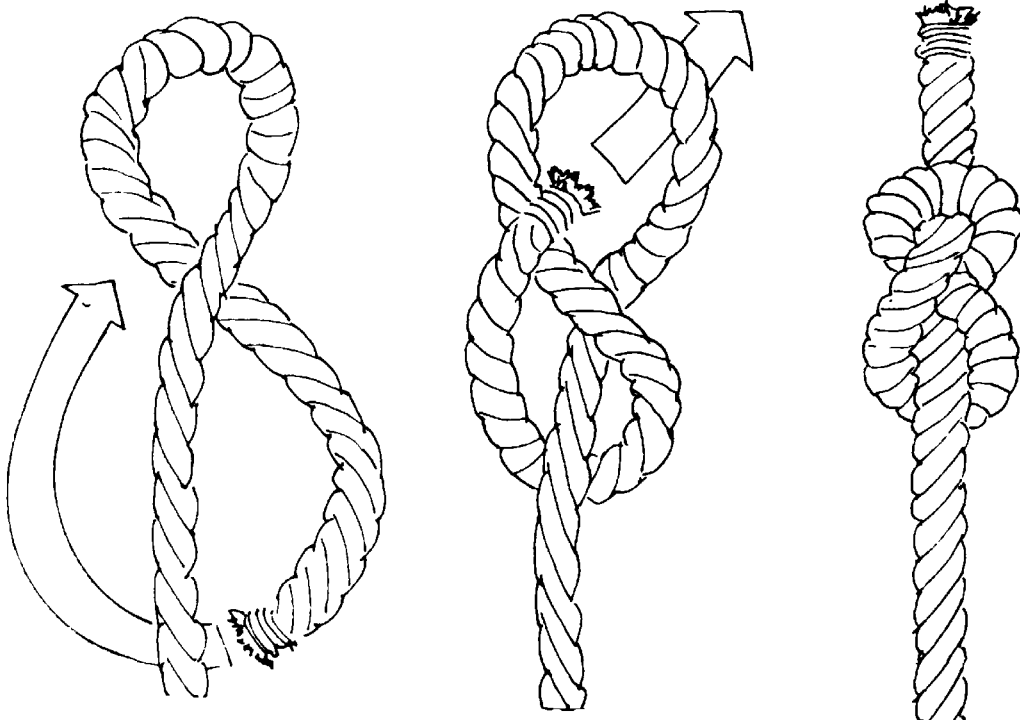
1. Make a loop in the rope end (the rabbit hole).
2. Pass the free end up through the rabbit hole (the loop).
3. Then pass the free end around the rope end (the tree).
4. Bring the rope back through the rabbit hole (the loop).
5. Pull the knot tight.



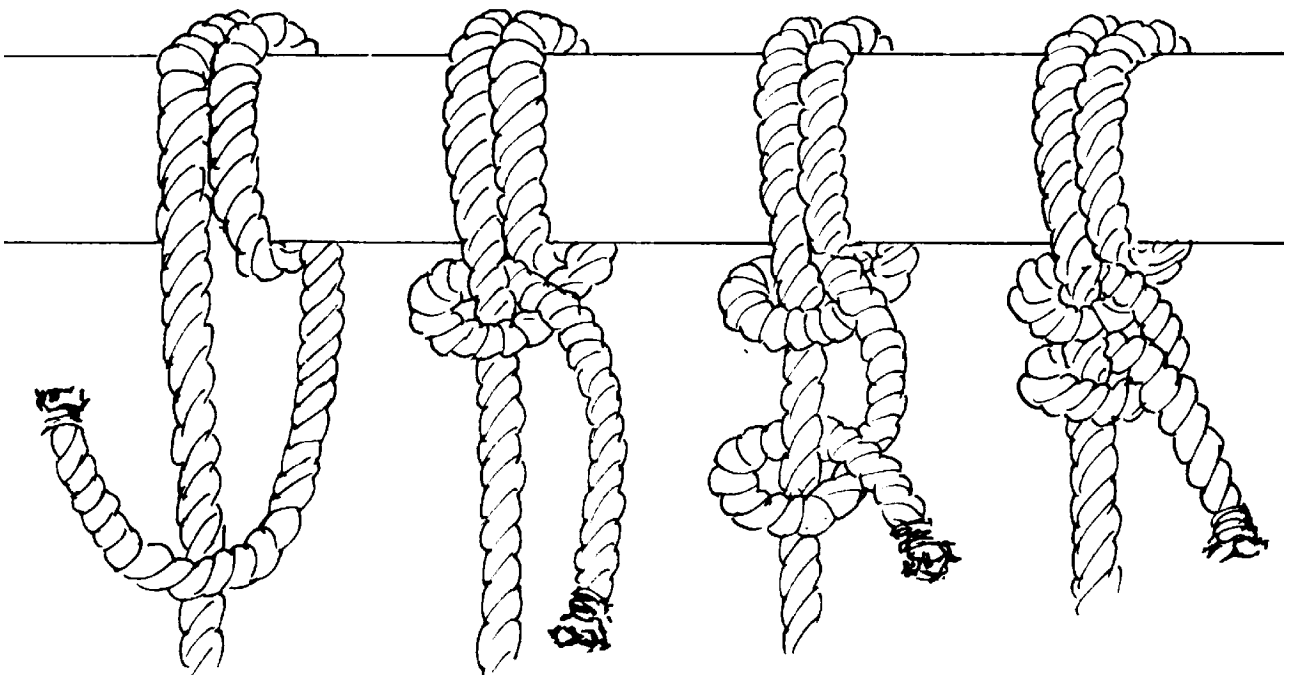
Name: _____

See if you can tie these knots. Find out where they are used.

Figure of 8 knot



Round turn and two half-hitches



Name: _____

Mini boats that float

Make a sailboat that floats and carries some weight.

What to do

1. Examine the materials you have to make your boat. Now draw a simple plan.
2. Using the selection of materials design a boat that floats and will carry some weight.
3. Experiment with the ball of plasticine. What happens when you drop it into the water? Can you shape the plasticine to make it float?
4. Experiment with five cent pieces to see how much weight your boat can carry before it sinks.
5. If you make sails how can you make your boat sail in a straight line when you blow on the sails?

Materials needed

You will need a variety of boat building materials

- Cut out the base from a milk carton or soft drink bottle.
- Plasticine, string, the bottom of a plastic drink bottle or carton, paper, scraps of fabric and any other materials.
- Five cent pieces or small metal objects to use as weights
- Glue, tape and scissors



Name: _____

Boat parts

Use the following words to
Boom, tiller, mainsail, mast,
Label the port and

label the correct parts of a sailboat.
mainsheet, centreboard, rudder.
starboard side of the boat.



Write a sentence about what each part is responsible for.

Sailing lessons!

Go for a sail!

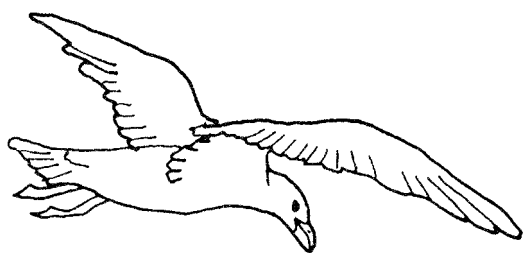
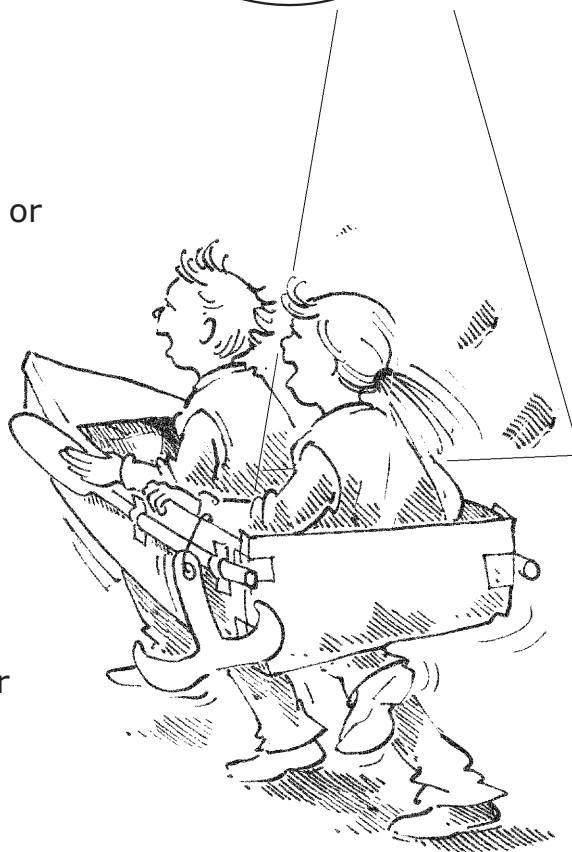
Organise for your class to go to a lake, bay or beach and take some sailing lessons or go on a sailboat! Learn some more about the winds before you go. You could try a sailboard or a small mirror sailboat.

If you can't get to the water, bring the water to your classroom!

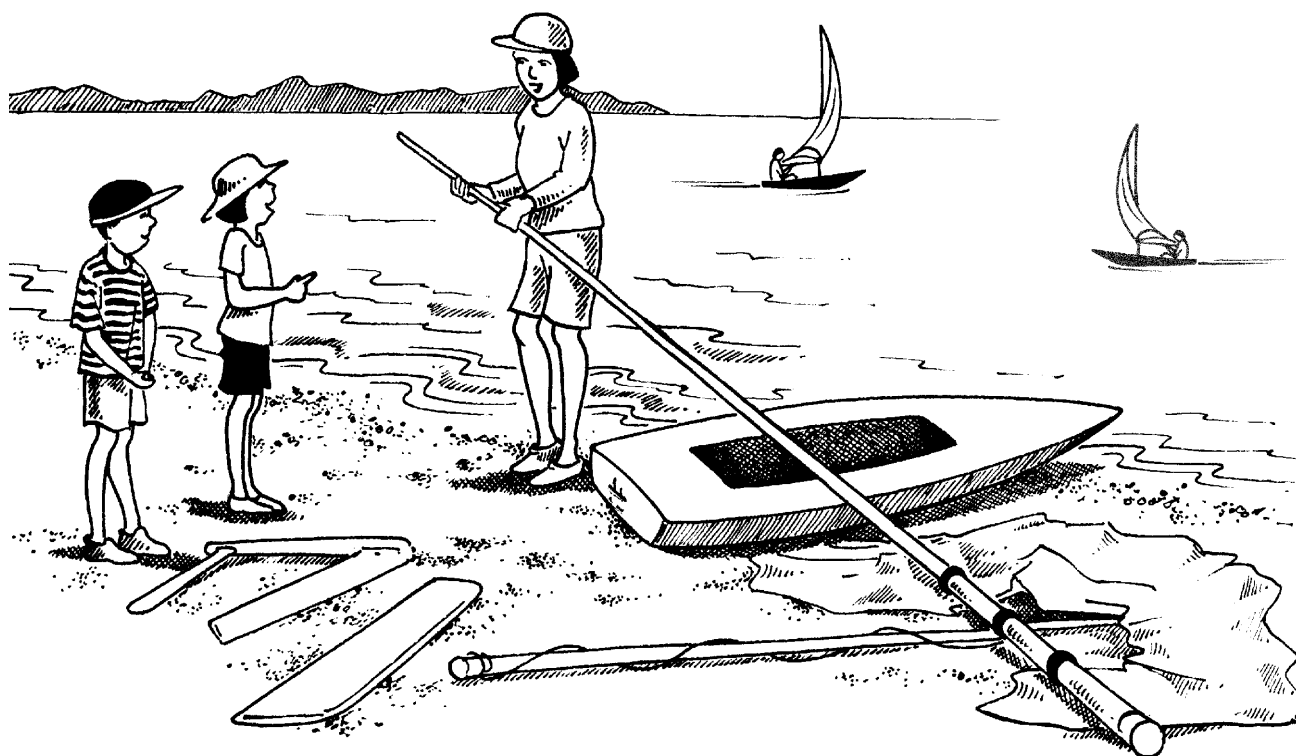
Make up a play or short drama that involves small boats and the water.

Make some boats from cardboard and sail around the classroom.

Invite someone who sails to tell you of their adventures.



Contact your local sailing club to organise lessons by a qualified sailing instructor.



Name: _____

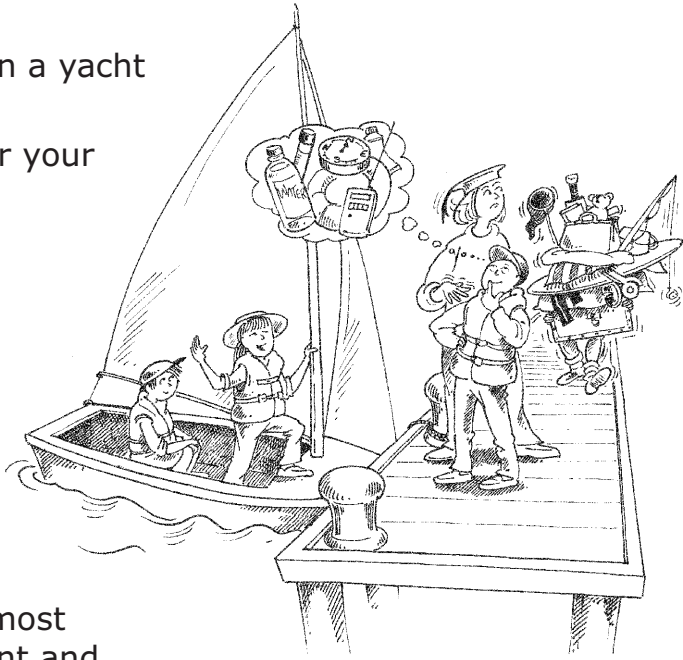
Survival kit

You are off on a sailing journey on a yacht with two friends.

You have to pack a survival kit for your journey.

There is not much room left so it cannot be too big!

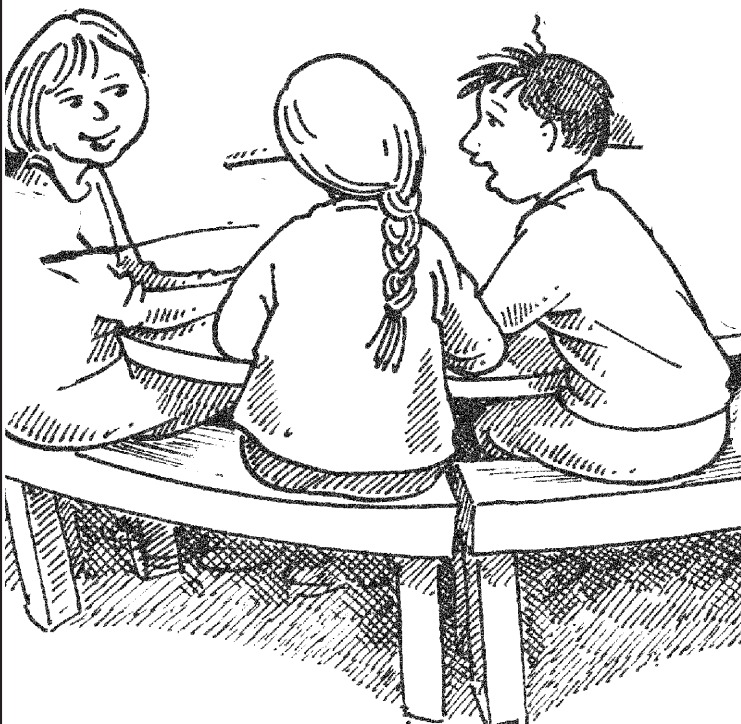
You are only allowed 10 items to take.



What will you take?

- In a small group of three, decide what you will pack in your survival kit.
- Rank these in order from the most important to the least important and explain your choices.
- Share your survival kit with others in their small groups.

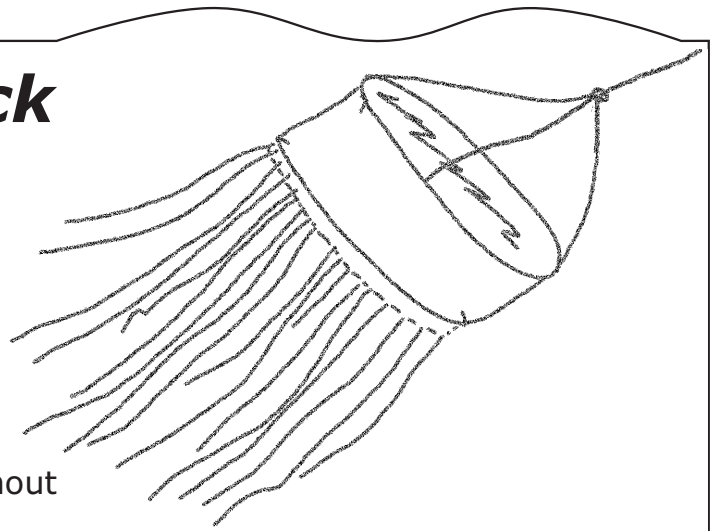
Our list



Name: _____

Sea jelly windsock

Make a sea jelly windsock to hang at school so you can learn how to read the strength of the wind! Make the windsock, then, using the Beaufort scale, measure the wind in knots, at your school for one week. Record your answers in a chart. By watching your windsock you will soon be able to guess the strength of the wind without the scale!



Step 1: Bend the wire coat hangers into two circles of equal size. Measure the circumference of the circles and cut a piece of material (lengthways in a rectangular shape) about 5 cm wider than the circumference, (enough to fold over the top of the wire hanger and the bottom wire hanger). The length of your windsock will depend on the length of the material you cut.

Step 2: Wrap the top end of your material strip around one of the wire circles, fold the fabric over and glue it, enclosing the wire circle.

Step 3: Do the same to the bottom wire circle.

Step 4: Glue strips of material, streamers or ribbon to the lower wire hanger around the edge.

Step 5: Tie some string to the top wire circle and hang your sea jelly windsock outside, in an open place where the wind blows.

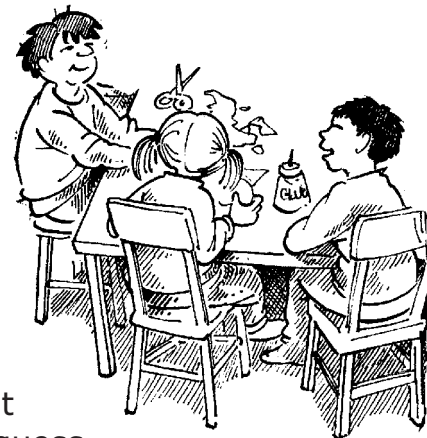
Materials

- Two coat hangers
- Wire cutters
- Pieces of material
- A measuring tape
- Strips of fabric, ribbon and streamers
- Scissors
- Glue
- String

Extension activity:

Using the Beaufort scale (an international scale of wind velocities) observe your sea jelly windsock each day for one week, morning and afternoon. Try to work out what the scale is each day by describing the wind force. From this you will be able to work out the approximate wind knots on the ocean, wave height and wave shape. After a while you will be able to guess the wind scale just by looking at your wind sock!

The Beaufort scale can be accessed on the internet at www.anzsbeg.org.au



Name: _____

What happened?

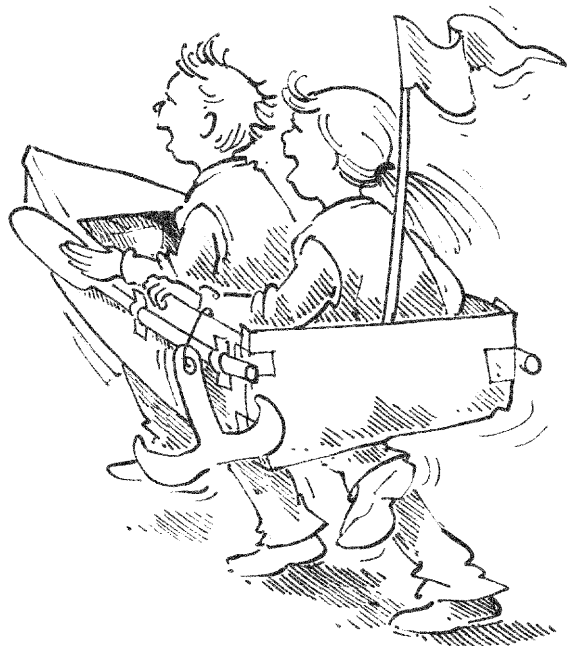
Can you number these in the correct order that they happen?

Capsizing the boat

- [] Bail the water out, don't sail on until most of the water is drained from the boat.
- [] Check everyone is alright.
- [] Crew holds the bow of the boat into the wind.
- [] Once the boat is upright, climb in on the windward side.
- [] Skipper grabs the centreboard and uses their weight to pull the boat upright.
- [] Skipper and crew fall into the water.

Coming in after a sail

- [] Crew holds the bow of the boat while the skipper takes off the rudder.
- [] Skipper pushes the tiller away and points the boat up into the wind.
- [] Wait till you can see the bottom.
- [] Sail slowly in by letting the sails out.
- [] Crew jumps out on the windward side, when the water is about waist deep.
- [] Crew pulls the centreboard up



Book 14

Food from the Sea

Before reading the book

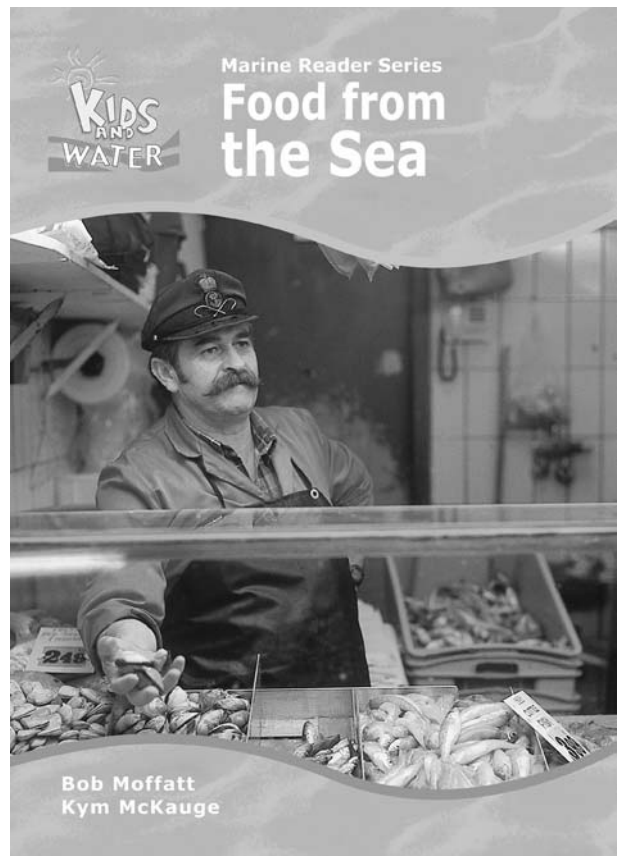
- Organise a fish eating/cooking day with the class at school.
- Discuss what types of seafood to bring or cook.
- Brainstorm some different types of seafood people like and don't like.
- Discuss how people feel when they touch, see, smell, taste seafood.
- Take a visit to the fish shop to find out what they sell.

After reading the book

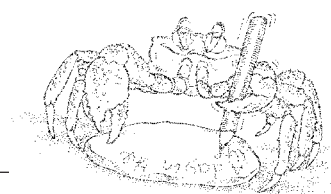
- Recall and discuss information from the text.
- Share experiences.
- Use the index to refer back to unfamiliar terms for discussion.
- Use the following activities to extend interest, knowledge and further processing of the text.
- Use the pictures to emphasize the changes from traditional fishing methods to modern techniques.

Other suggested activities

- Visit an aquaculture farm.
- Organise a class debate.
- Carry out a fish dissection to learn more about fish structure and its habitat.
- Design a survey to find out how many people eat seafood. Is it never, once a year, once a month, once a week or every day? Graph the results.
- Make a collage of seafood products we eat.
- Write a poem or make up a song about seafood.
- Write an advertisement for a seafood product.
- Research what fish are being overfished. Use newspapers and the internet to find out what the problems are.
- Invite a fishing expert to speak.



Learning outcomes



Activity	KLA	Outcome
1 Fishy prints - p15	SOSE The Arts	CULTURE – 4.8 Describes beliefs and social organisation of groups in communities other than their own. VISUAL ARTS – 4.22 Selects, combines and manipulates images, shapes and forms using a range of skills, techniques and processes.
2 Fish and chips -p16	Health SOSE	PEOPLE AND FOOD – 4.7 Identifies issues related to why individuals and groups in the same community may have different eating and meal patterns. RESOURCES – 4.10 Describes factors that affect resource use and development.
3 Ocean to the dinner plate - p17	Science SOSE	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem. RESOURCES – 4.10 Describes factors that affect resource use and development.
4 Sea shore heads - p18	English Science	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem. RESOURCES – 4.10 Describes factors that affect resource use and development.
5 Supermarket surfari - p19	SOSE Science	RESOURCES – 4.10 Describes factors that affect resource use and development. LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem.
6 Its a crab's life! - p20	Science	LIFE AND LIVING – 4.8 Explains the functioning of systems within living things.
7 Local fishing information - p 21	SOSE	RESOURCES – 4.10 Describes factors that affect resource use and development. NATURAL AND SOCIAL SYSTEMS – 4.15 Identifies decisions that have to be made by groups and individuals about production and consumption.
8 Aquaculture research - p22	Health & PE SOSE	PEOPLE AND FOOD – 4.7 Identifies issues related to why individuals and groups in the same community may have different eating and meal patterns. RESOURCES – 4.10 Describes factors that affect resource use and development.

Fish prints

Before cameras, the Japanese fishers would keep a record of their catch by making a fish print - this art is called gyotaku. Students will learn about the physiology of fish in a fun way that has been practised in Japan for more than 100 years.



- Step 1: Wash the fish thoroughly with soapy water first and dry it with the paper towel.
- Step 2: Lay the fish on a sheet of newspaper, spreading the fins out and holding them with tape if necessary. Paint one side of the fish with the paint. Brush the paint from head to tail making sure the paint catches under the scales and spines.
- Step 3: Paint the fins and tail last and do not paint the eye.
- Step 4: Carefully and slowly lay a sheet of white paper over the fish. Take care not to move the paper and use your hands and fingers to gently press the paper over the fins and tail. Be careful not to wrinkle the paper or your print will be blotchy.
- Step 5: Slowly peel the paper off. Paint in the eye with a small brush. Leave the print to dry somewhere.

(wash off all the paint immediately if you intend on eating the fish after)

Materials

- 1 whole fish (rough, scaly fish from a market or fish shop)
- Paper towels
- Newspaper
- Water based paints
- Paint brushes
- White paper for printing on
- Tape

Extension activity

1. Before making the print, have the students draw a fish and label the parts of the body. Compare their drawings with that of the whole fish. What did they forget? What does their fish have that the specimen does not? What is different?
2. After making the fish print discuss the following adaptations:
 - The shape of its body - is it long, short, round? What might the shape of its body tell you about where it lives?
 - Look at the fins - the dorsal and anal fins are used as rudders to prevent rolling
 - The pectoral and pelvic fin are used for turning, balancing and braking. The caudal fin pushes against the water and propels the fish. Where are the fins located? (See page 4 of book 15 - *Classification and Survival* for a picture of fins).
 - Look closely at the scales and colour of the fish - how big are they? What shape are they? Does its colour provide camouflage? How could its colour help protect it?

Name: _____

Fish and chips

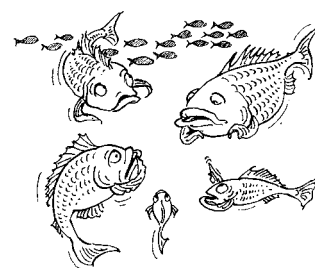
Take a visit to your local fish shop or fish market where a range of fish products are sold.

Make up a list of questions to ask the people selling the fish before you go.

Try to find out the following information as well.

- The percentage of imported fish cooked in the fish shop.
- Where the local fish is caught and by whom.
- The most popular fish people buy.
- How the staff in the shop prepare the fish for sale.

Questions to ask



Name: _____

Ocean to the dinner plate

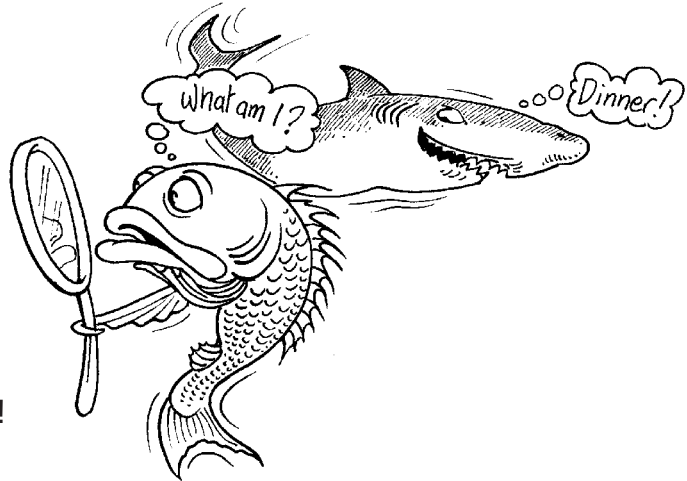
Brainstorm a list of different types of seafood we eat.

- Choose one of these and make a creative timeline to tell a story about its life from the ocean to the dinner plate!

Display your timeline on a poster!

- Find out about its life cycle in the sea, describe how it was caught, after it was caught, where it was sold from, who bought it and how it was cooked and who ate it!

Be creative and tell a story along the way!



Fisheries action program

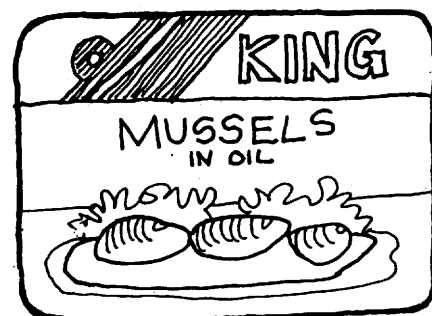
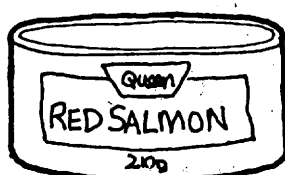
Find out how you can become involved in fish habitat restoration and fish management.

Fisheries Action Program

Agriculture, Fisheries and Forestry

GPO Box 858

Canberra ACT 2601



Name: _____

Seashore heads!

How much do you know about seafood?

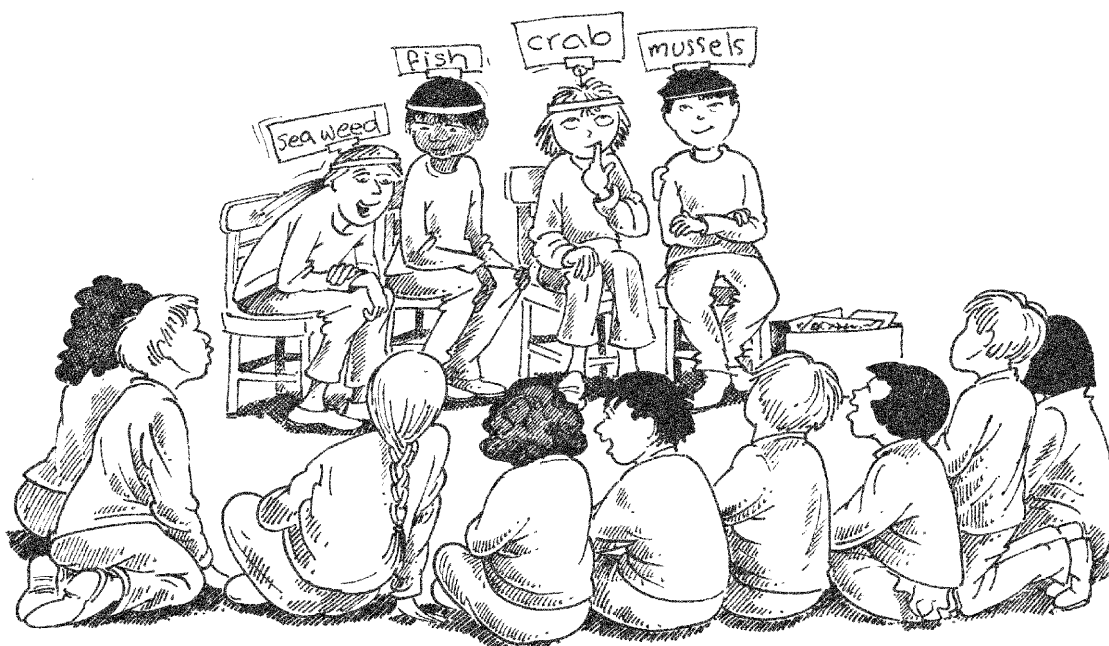
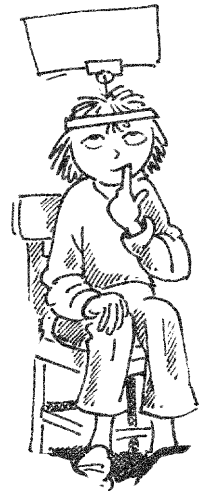
This activity encourages students to think about the structure and function of sea creatures that we eat as seafood.

Activity

- Four students are chosen to wear a headband. They sit in a chair facing the rest of the group.
- The teacher or a student draws a card out of a box with the name of a food from the sea. The volunteers must not see the name on the card.
- The name is then placed into the clip on the top of the heads facing the rest of the group.
- The students in the chairs ask questions to determine what food from the sea they are.
- They can only ask YES or NO questions. The audience can only answer YES or NO.
- The student who guesses their sea creature first is the winner.

Materials

- Headbands with a large bulldog clip attached to the top
- Cards with a 'food from the sea' sign written in bold print, e.g. prawns, crab, calamari, whiting.

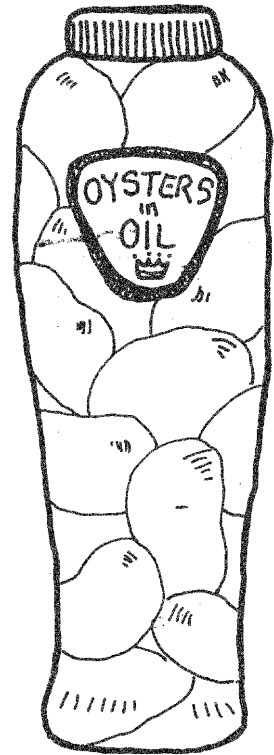


Supermarket safari!

The sea is a source of food for us. Many products in our supermarkets come from the sea.

Activity A

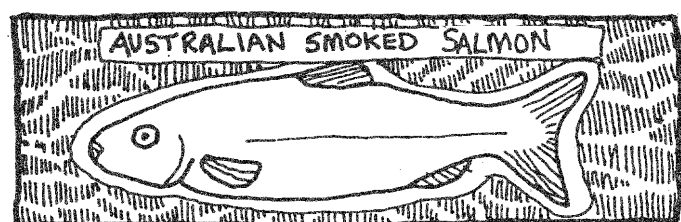
- Visit your local supermarket and record all the products that you can find that have something to do with the sea.
- Read the ingredients of products because some things you may think have nothing to do with the sea probably do. For example toothpaste has carrageenan - a red seaweed. Record how many you found. Make a chart or a poster to display.



Activity B

Choose a food product that has come from the sea and has a logo or environmental message on it, e.g. dolphin logo.

- Write to the manufacturer for information about the product. If the product has an environmental logo, message or theme - find out what it means. For example is it dolphin safe or just a picture of a dolphin. Write to consumer affairs to find out more about environmental labelling.
 - Describe your sea creature. What does it look like? What does it eat?
 - Where does it live? What shares its environment? What is happening to the sea creature now? What might happen in the future?
 - What country does it come from?
 - Where does the sea creature used in the food product come from?
 - Find out about the life cycle of the sea creature used.
 - What part of the ocean has it come from?
 - How was it caught?
 - How quickly does this sea creature reproduce?
 - Is this creature under any threats?
- Create a poster to display all the information you found out about the product you chose.



Name: _____

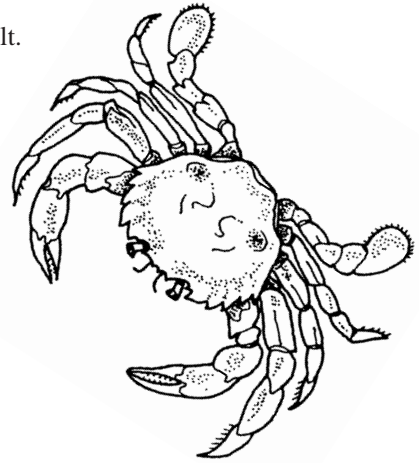
It's a crab's life!

The life cycle of a crab includes several stages; egg, several larval stages and adult. In order to grow, a crab must moult. It sheds its hard outside shell and grows a new covering that becomes hard.

In the classroom

Research the life cycle of a crab.

- To what extent does a mother care for her eggs and babies?
- How does the baby crab change? It grows and changes shape many times. Then it sinks to the bottom of the sea and begins its life as an adult.
- What are the advantages of a hard outside skin? How does a crab survive in its environment?
- How often does a crab moult?
- Students can draw or paint the life cycle stages of a crab on sheets of paper and tape the ends together to make a life cycle wheel.



At the beach

Students will often find what they think are “dead crabs”. These are often the cast off shells of crabs that have moulted their hard outside skins and moved on.

- The moults are often found complete with eye sockets, head and legs! As the crab grows the shell is cast off.
- A slit occurs along the line at the back where the body turns under to become the tail.
- The crab backs out of its shell through the opening at the rear.
- The new shell is soft and the crab will blow its body up to increase its size and hide under a rock for a few days until the new shell has hardened.
- The moult will be light, you will be able to easily lift the exit area and the cast off gills are likely to be still attached.

If you have found a dead crab the shell will be heavy and you will be unable to easily lift the carapace and the smell will probably let you know!

- Look for a crab moult at the beach.
- Look closely and see if you can lift the carapace easily.
 - Are the gills still attached?
 - Are the eye sockets still visible?
- Guess if it was a male or a female by looking under the carapace.

The females have a wide tail tucked flat underneath and the males have longer thinner tail tucked flat underneath,

- Why would a female crab have so many eggs?
- Write a story about a crab moulting.



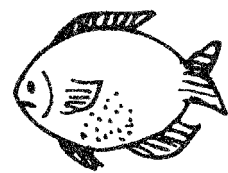
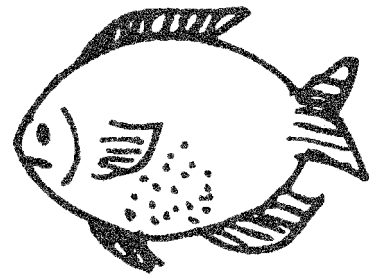
Name: _____

Local fishing information

What are your local fishing rules?

Design a poster or a pamphlet that you can display in your local fish shop, bait and tackle shop or even on a pier nearby, that gives information about fishing regulations for your area.

- How many fish are you allowed to catch?
- How big do they have to be to keep them?
- When are you not allowed to fish?
- Are there any fish you cannot take?
- Are there any restrictions on fishing equipment?
- Find out about special nets that exclude non target species, e.g. how does a turtle exclusion net work?



Join your local Fishcare program and become a volunteer! Search this site to find out more:

www.wa.gov.au/westfish

A good project is to find out about local fish size limits, quotas, closed seasons and closed water, and if there are any equipment restrictions.

Name: _____

Aquaculture research

Organise for the class to visit an aquaculture farm.

Find out the following information or use the library and the internet .

What is aquaculture?

What type of marine species are being farmed in Australia?

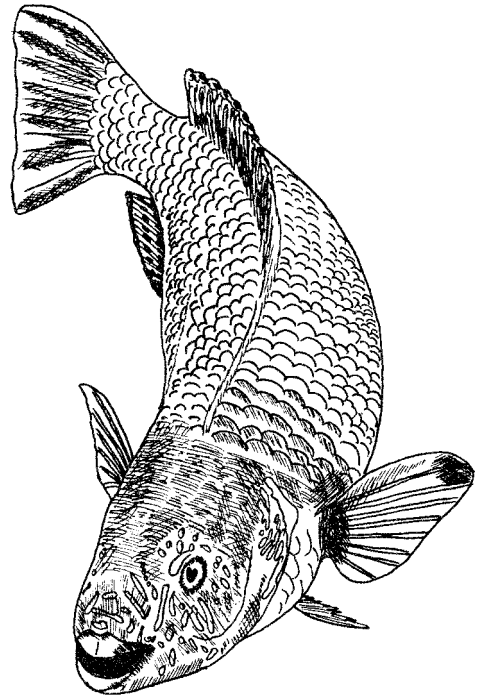
What type of pens do they hold the fish in?

How do they feed the fish?

How are they caught and sold?

What are some of the concerns with aquaculture?

Do we need aquaculture? Briefly discuss why or why not?



Book 15

Classification and Survival

Before reading the book

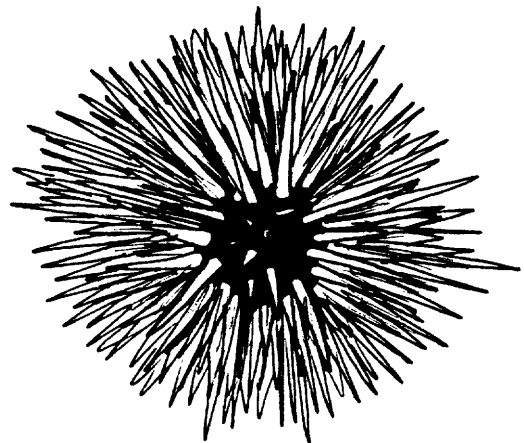
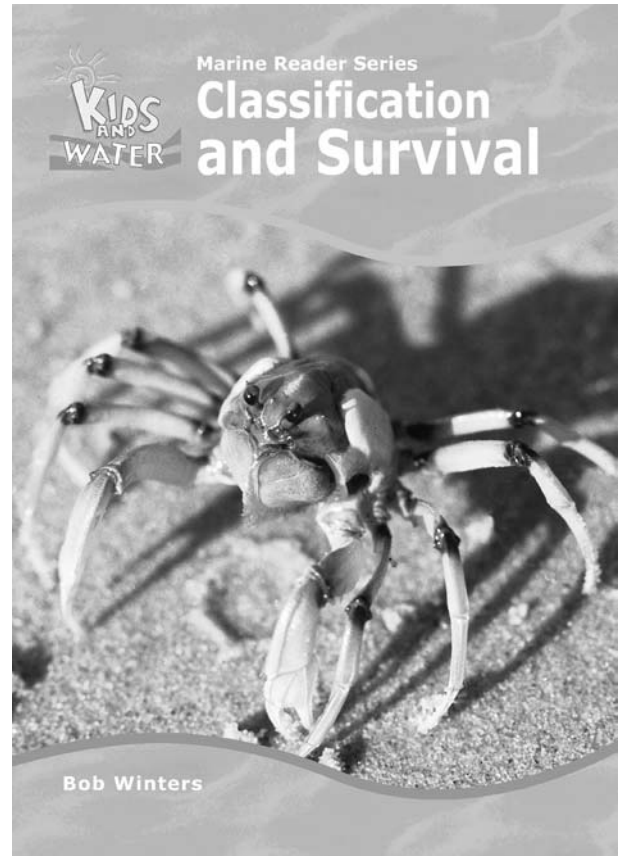
- Discuss with the class what things they can think of in everyday living where things are grouped together. (See Supermarket surfari page 19 or ask students about classification in a library.)
- Do the Tail shapes activity on page 25, to introduce the concepts of how scientists classify animals.

After reading the book

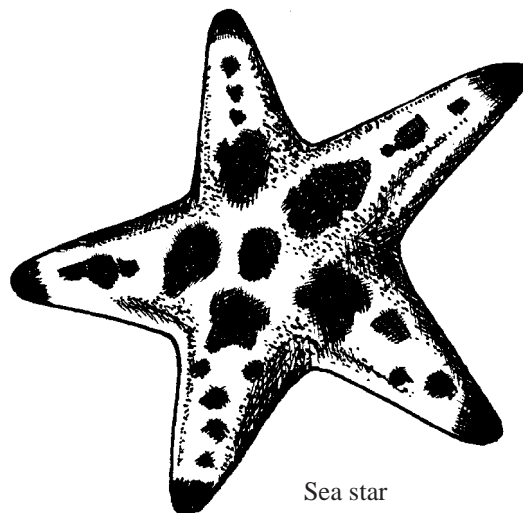
- Use the index to help define and utilise unfamiliar concepts.
- Discuss and analyse the text.
- Students can construct interpretive responses by referring to the text and their own knowledge and experiences.
- Discuss and compare a Scientist's method of classifying sea creatures to the students method as completed in the pre-reading activity.

Other suggested activities

- Research a sea mammal. Find out things like what it eats, where it lives and how it has its young.
- Many people have an opinion about sharks. Design a survey to find out about peoples attitudes toward sharks. Are they fish? How are they different? Find out what types of sharks come into your area. What types of shark do people eat?
- Write a newspaper article about one of the species in the book. Imagine the creature had never been seen before and had been discovered by you. Describe to your audience all about it.
- Write a Haiku poem about a sea creature.

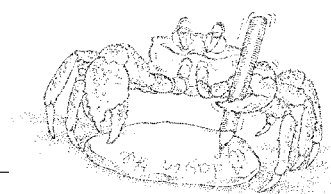


Sea urchin



Sea star

Learning outcomes



Activity	KLA	Outcome
1 Tail shapes or body shapes -p25	Science	LIFE AND LIVING – 4.9 Explains how living things have changed over geological time, using evidence from various sources.
2 The difference is ... - p26	Science	LIFE AND LIVING – 4.8 Explains the functioning of systems within living things. 4.9 Explains how living things have changed over geological time, using evidence from various sources.
3 Flash fish! - p27	Science SOSE	LIFE AND LIVING – 4.9 Explains how living things have changed over geological time, using evidence from various sources. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
4 Marine measurements - p28	Mathematics	MEASUREMENT – 4.18 Selects appropriate attributes and units of a sensible size for the descriptions and comparisons which are to be made.
5 Marine mates - p29	English Science	SPEAKING AND LISTENING – 4.1 Interacts confidently with others in a variety of situations to develop and present familiar ideas, events and information. LIFE AND LIVING – 4.8 Explains the functioning of systems within living things.
6 Explore a mini habitat - p30	Science SOSE	LIFE AND LIVING – 4.8 Explains the functioning of systems within living things. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
7 All things have needs - p31	Science SOSE	LIFE AND LIVING – 4.8 Explains the functioning of systems within living things. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
8 Is a whale a fish? - p32	Science SOSE	LIFE AND LIVING – 4.8 Explains the functioning of systems within living things. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.

Name: _____

Tail shapes or body shapes?

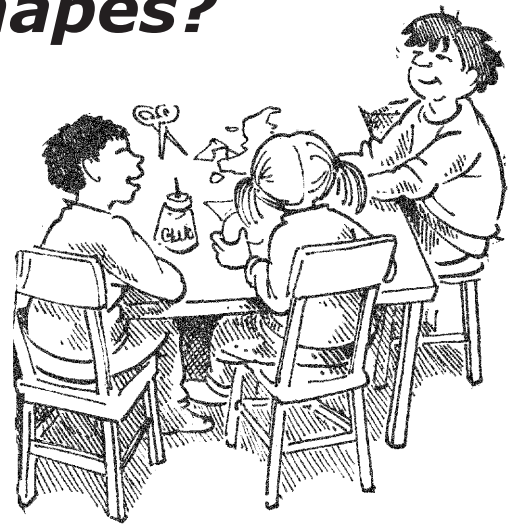
Do this activity before reading Book 15 - *Classification and Survival*

There is always a need to sort things into groups. Whether you are in a supermarket looking for a certain item, or finding a phone number in an address book. Grouping things helps with identification and description.

Grouping can be done by colour, size, shape, alphabetically, structure and by many other ways. Scientists use structure to classify animals and plants.

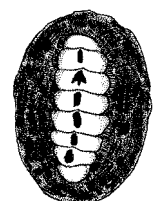
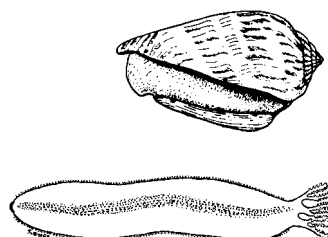
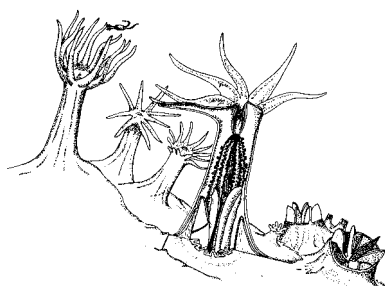
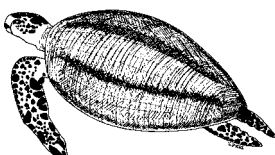
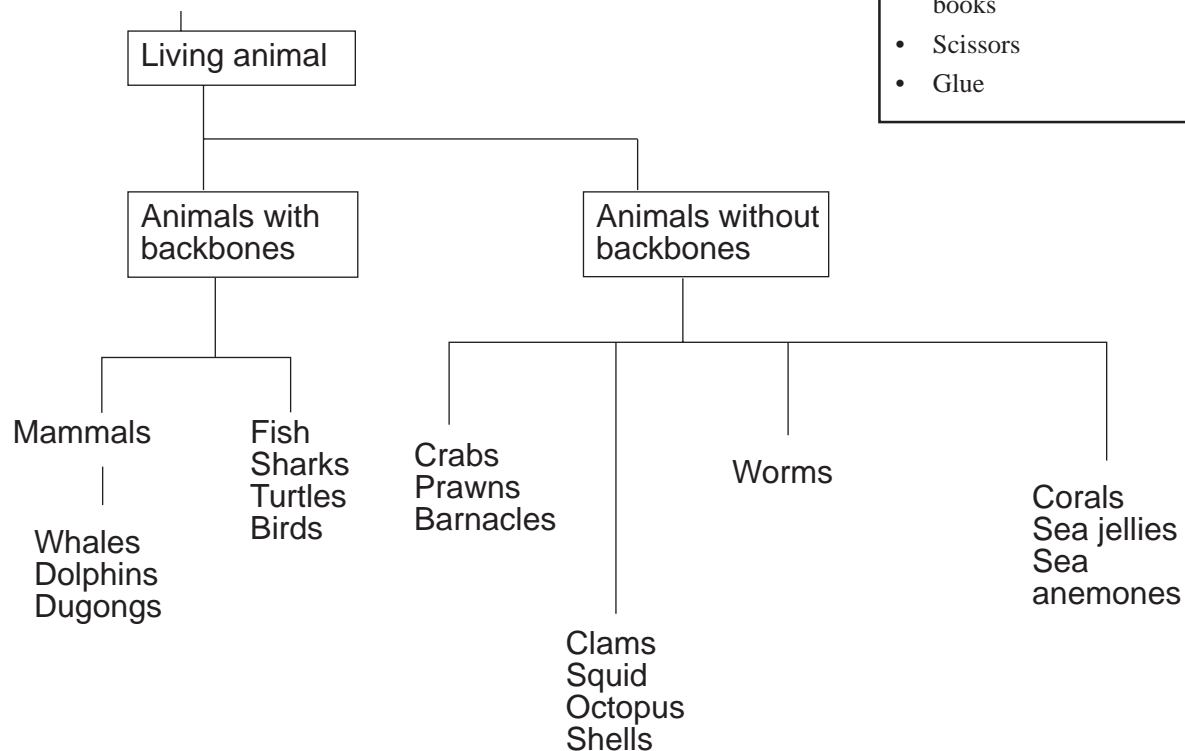
Activity

- Step 1 Have students work in small groups. Copy or cut out pictures of sea creatures from magazines or another source. Include a wide range of sea creatures, from corals to crabs and different types of fish.
- Step 2 Ask the students to come up with a way to place the organisms into groups that "go together". For example fish tail shapes, shapes of shells, colour, there are many different ways.
- Step 3 Ask someone from each group to explain why they chose to group the organisms in the way that they did.
- Step 4 Then ask the class to discuss the best ways of classifying.
- Step 5 Now introduce Book 15 – *Classification and Survival*



Materials required

- Magazines or posters with pictures of sea creatures or photocopies of sea creatures from these teacher resource books
- Scissors
- Glue



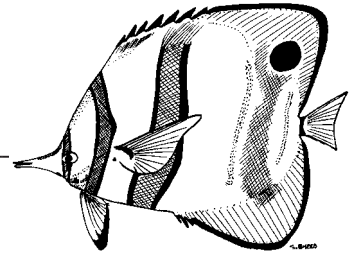
Name: _____

The difference is

Use the book - Classification and Survival to help you with your answers.

Describe two ways in which fish protect themselves.

1.



2.

How is a shark skeleton different from a fish skeleton?

Write the names of two sea mammals.

Describe some of the common features of sea mammals?

What strange adaptation does a sea star have to eat its food?

Mollusc is the name given to a group of animals that mostly live in shells. But this group also includes some sea creatures that do not live in a shell.

Can you name three of these?

Flash fish!

This is a fun activity to help students learn more about how a creature survives in the marine environment.

Activity

Step 1 Split the class evenly into two or more teams.

Each team will cut out as many pictures of sea creatures as they can find without letting the other team see what sea creatures they have.

Step 2 Sitting on the floor, two students act as the "blanket keepers" and hold a blanket or sheet between the two teams so they cannot see each other.

While the blanket is raised, each team consults amongst themselves to decide which picture to flash.

Step 3 On the count of three, the blanket keepers drop the blanket. A team member is revealed on each side, holding up one of their pictures for the opposite team to see.

Step 4 The first team names the sea creature and makes a statement about how that creature survives will score a point (which can be recorded by the blanket keepers). For example how it gets its food, how it moves, how it protects itself.

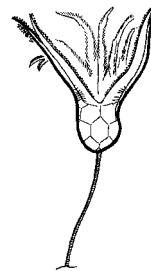
Step 5 Once the correct name has been guessed, the blanket keepers raise the blanket and each team decides on the next sea creature to flash.

Continue until all cards have been flashed!



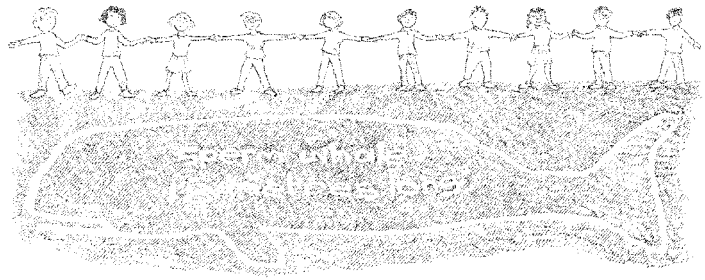
Materials

- Marine magazines, Australian geographic magazines, posters, fishing magazines or photos could be used to cut out pictures of sea creatures.
- Sheet or blanket
- Scissors



Marine measurements

Making marine measurements on a rope gives the students an idea of the size of some of the sea creatures in comparison to people.



Once the rope is extended, students can walk next to the rope to count the number of steps that equal a blue whale's length. Have the students lie end to end to see how many students long a blue whale is.

Step 1: Choose the marine creatures to represent on your rope. Choose ones you know and ones in your local area. Make a list of these. Include humans or your own length measurements.

If you are including the blue whale, the largest animal on earth, the rope will need to be 30.5 metres long.

Step 2: Make labels for each animal with their name and length on

Punch a hole in each one and tie a string through each one.

Laminate these so they last longer.

Step 3: Using the black marker mark off the lengths on the rope and attach the labels (attach them in a way so that they won't slip or slide along the rope).

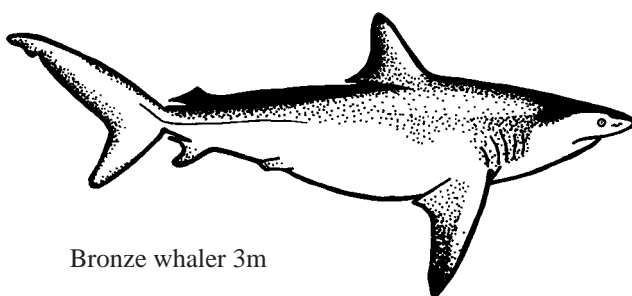
Step 4: Unravel your rope. Have some other students try to guess the type of sea creature by its size. You can include more information or clues about each animal on the card and have a guessing competition.

Materials

- Long rope or string (about 40 meters is best)
- A permanent black marker to mark off lengths on the rope
- Coloured card for the name labels of the sea creatures
- A wheel to store the rope around
- Single hole punch and string

Some examples are:

- | | | | |
|-----------------------|--------------|----------------------|-------------|
| • Common dolphin | 2.5 m | • Grey whale | 14.1 m |
| • Bottle-nose dolphin | 4.5 m | • Humpback whale | 16 m |
| • Killer whale | 9.5 m (male) | • Blue whale | 30.5 m |
| • Sperm whale | 18 m | • Port jackson shark | 1.4 m |
| | | • Grey nurse | 5 m |
| | | • Snapper | 1.25 m |
| | | • Bronze whaler | 3 m |
| | | • Porcupine fish | up to 45 cm |



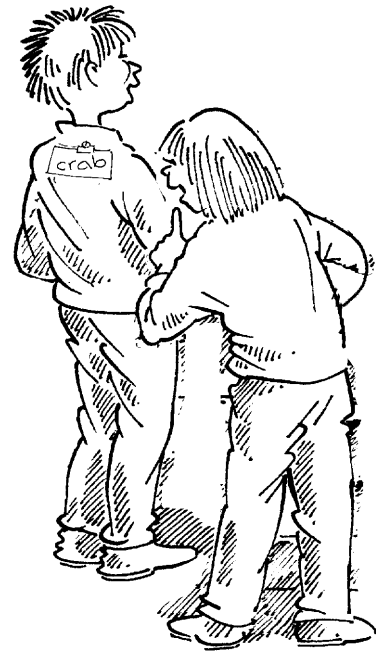
Bronze whaler 3m

Marine mates

This activity is a fun way for students to learn about classification and specific features of sea creatures.

Activity

- Students can brainstorm different sea creatures within the same groups e.g. molluscs – sea snails, clams and mussels; mammals – dolphins, dugong, southern right whale; bony fish – flounder, angelfish, weedy seadragon; sharks and rays – manta ray, great white shark.
- Choose four of these groups and a number of sea creatures to represent each group. The number of sea creatures you choose will depend on the number of students in the class.
- Make up some cards with the names of these sea creatures.
- The teacher can then pin or stick a tag on each student's back so that they are unable to see it but all others can. Make sure the students do not see the card.
- Moving around the room, each student must then attempt to identify themselves by asking all other participants YES or NO questions about their features. They may only ask one question per person after which they must move on.
- Once the student determines their identity, they must seek out others in the same classification as them. This requires the student to deduce the relationship between their animal and all others represented.
- They are not able to help in any way to determine the identities of others in their group.
- Once others with the same classification have identified themselves they all group together and identify the classification to which they belong. The winners are the first to accomplish this.
- All other students must continue to identify themselves and group together with others in the same classification.
- Once all groups have been formed they must determine specific characteristics of the sea creatures that belong to the group and present these to the others in the class.



Materials

- Cards
- Sticky tape
- Pencils
- Safety pins

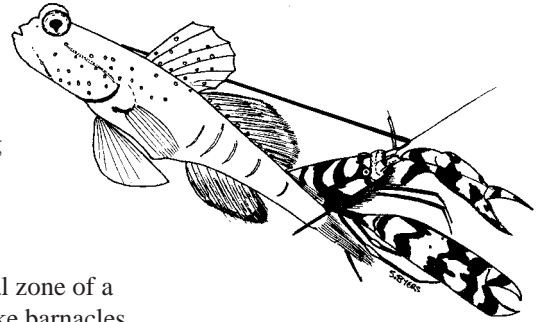


Name: _____

Explore a mini habitat

All living things depend on their habitat for survival.

Take the students on a field trip to the beach to explore the fascinating mini-habitat of a rock on a rocky shore.



Habitat discussion at the beach

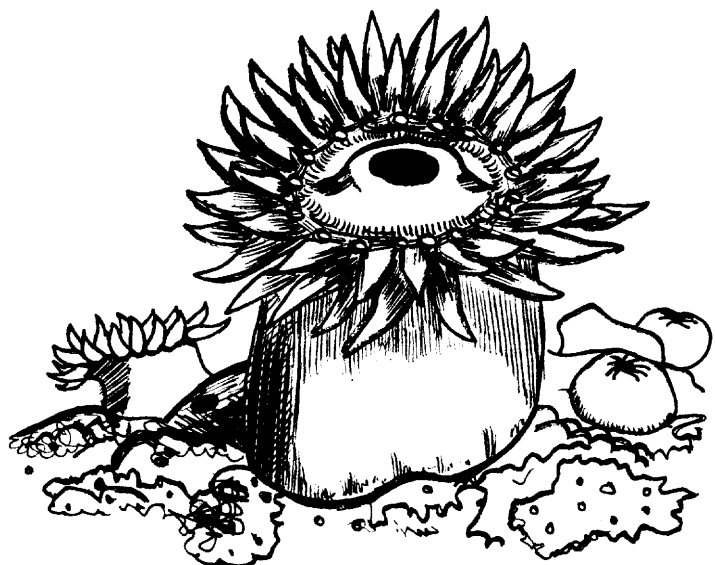
Have the students find a rock or small boulder to study in the intertidal zone of a rocky shore. Choose one with many interesting looking things on it like barnacles, periwinkles and limpets on the top, tiny tube worms and flatworms stuck to the underside, and worms and crabs burying themselves in the mud below!

Discuss the following about your mini rock habitat:

- Which habitat would have the greatest range of temperature (the on-top-of-the-rock habitat).
- Which habitats have a more stable temperature? (Under the rock, in the sand and mud and among the seaweed).
- Which habitats would retain the most moisture when the tide goes out? (Under the rock, in the sand and mud and amongst the seaweed) How are these organisms able to survive exposed to the air, wind and sun? (e.g. hard moisture filled shells to protect them from the sun.)
- What organisms are attached to the underside of the rock? What would happen if you left the rock overturned? What would happen to the organisms on the top of the rock if you left the rock overturned?
- When the rock is turned over what do the animals do? Do they move away quickly? Do they close up or go into tubes? Do they bury themselves? Do they stay quite still?
- Discuss some of the impacts of people on the rocks.

Conservation note

Handle the sea creatures with care and encourage the preservation of the beach. (If 30 students turned over rocks, dug up sand and mud and carted away animals to die in buckets the area would take a long time to recover.) Students will then appreciate that all living organisms have special needs.



All living things have needs!

Make a concept map!

- Part A:
- Write a topic on the board e.g. The sea. Have students brainstorm words they associate with the sea and write them on the board. (e.g. fish, seaweed, crabs, water, sea snails, rocks, waves, tides, sharks, dolphins, whales etc.)
 - Students can work in pairs and write all the words on strips of paper and attempt to group them. For example a student may decide to use the following groups:

Plants in the sea: seaweed, phytoplankton

Sea mammals: dolphin, whale

Dangerous sea creatures: sharks, blue-ringed octopus

Shallow water creatures: fish, crabs, sea stars

Deep water creatures: dolphins, sharks, whales

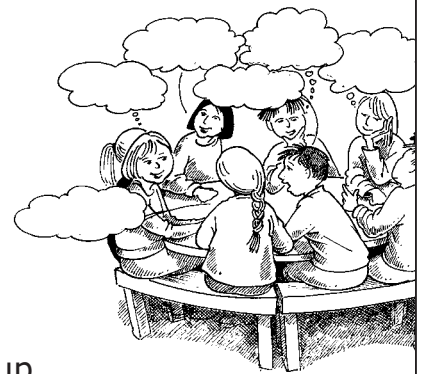
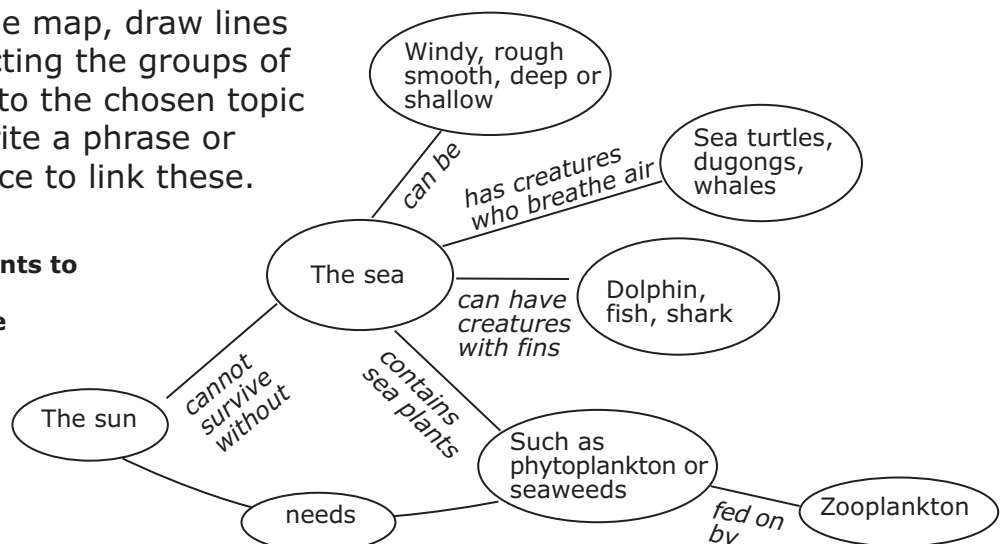
- Encourage the students to add more words as they begin grouping them! There will be many ways to group things.

The students discuss with another pair of students how and why they chose to group them in the way they did.

- Part B
- Again write the topic on a whiteboard or large sheet of paper (in the middle). Write the class list of words including any new words the students have thought of on flashcards. Give the flashcards out to the students and ask them to work together as a class to group them. Use Blu Tac to stick the flashcards onto the large sheet of paper or the whiteboard. Have three or four students placing their cards at a time and encourage the students to share ideas, discuss alternatives and give reasons for changing the order of the words. Point out that there is no right or wrong way to do this!

- Step 5:
- When the class is satisfied with the map, draw lines connecting the groups of words to the chosen topic and write a phrase or sentence to link these.

Encourage the students to share ideas, discuss alternatives and give reasons for changing the order of the words. Point out that there is no right or wrong way to do this. Let the students decide.



Name: _____

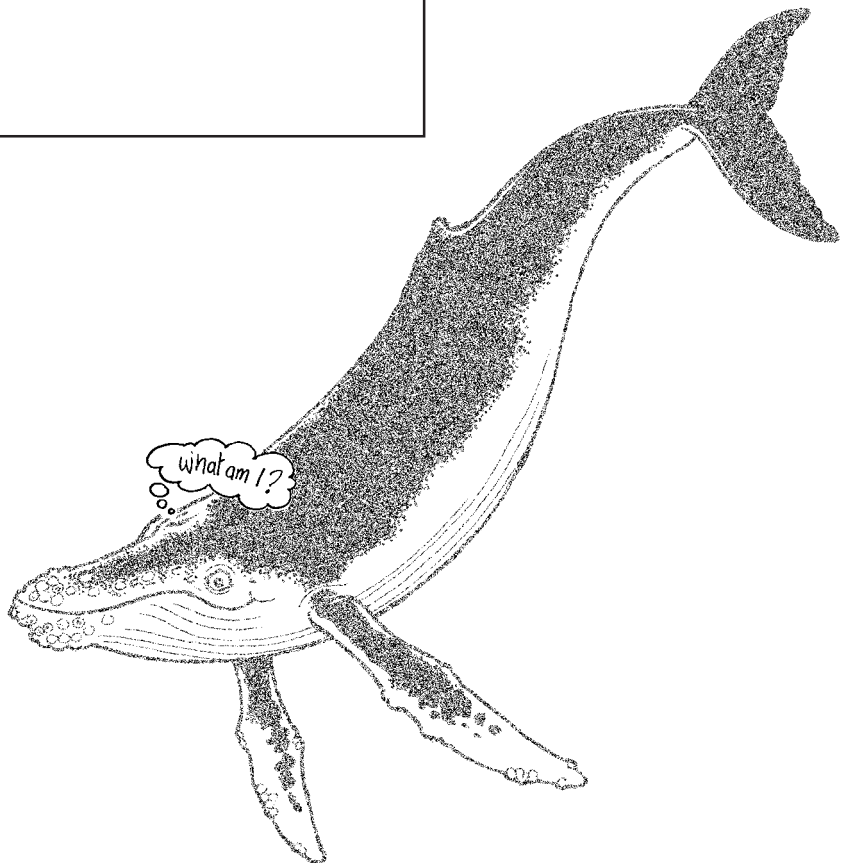
Is a whale a fish?

Find out the following things about whales and fish.

Find Out	Whale	Fish	Mammal
How does it swim?			
What does it eat?			
How does it breathe?			
What is its skin like?			
How are its young born?			
Where does it live?			

Classification?

Write a summary about your findings to answer the title question.



Book 16

Sea Creatures at Risk

Before reading the book

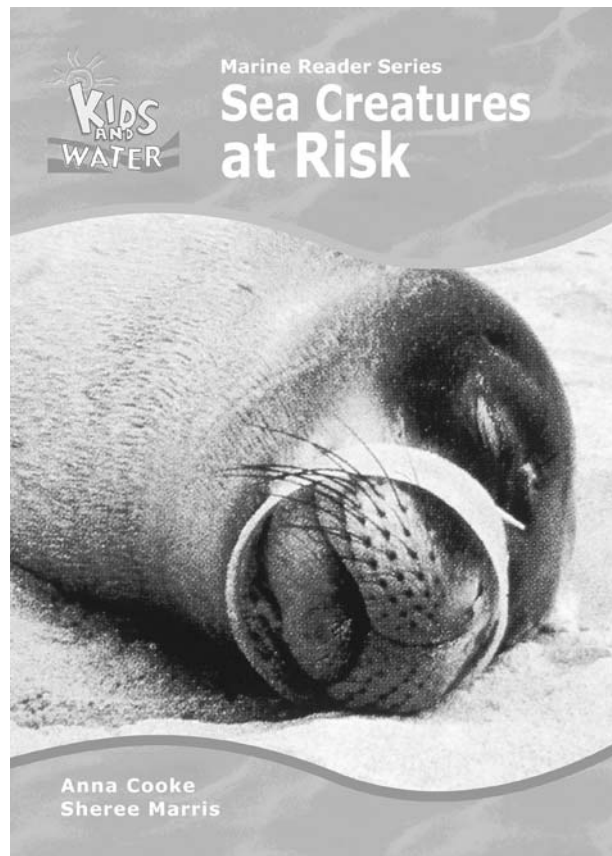
- Introduce the title of the book.
- Have the students brainstorm in small groups what the title may mean and what type of sea creatures are at risk and what are they at risk from.
- Discuss these risk factors and who might be responsible. What is the source of the problem?

After reading the book

- What risk factors were not mentioned by the book or by the students?
- What do the students think of sharks? Are they happy that some sharks are protected? Have they eaten shark before (i.e. flake).
- What do they think about whale hunting?
- Have they eaten seafood? What types? Do they like seafood?
- Use the pictures to create discussion.
- What are some solutions and things we can do?

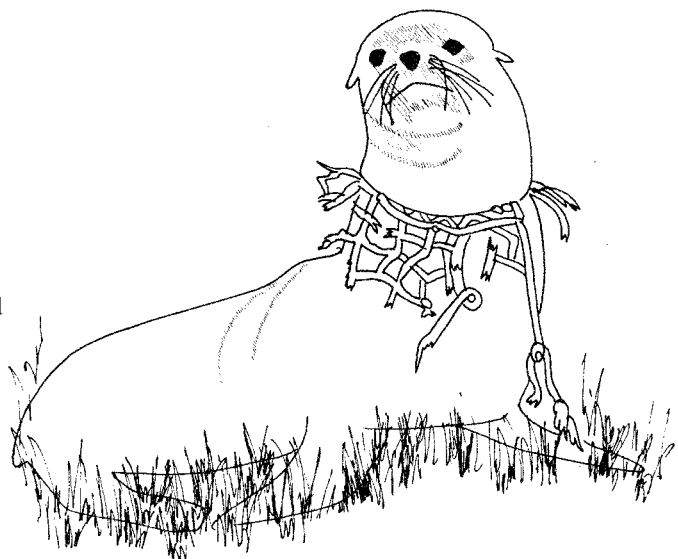
Other suggested activities

- Choose a sea creature at risk. Write a marine life report card. Include the following:
 - Title, classification, description, habitat, threats and summarising comments.
 - Find out about its habitat, and ecosystem. What are the threats to its ecosystem? Write a report for the survival of this species.
- Using charades, act out different scenarios about sea creatures and some risks to their survival.
- Access videos to show students.
- Investigate a marine pest that is found in your state.
 - Where did it come from?
 - How did it arrive?
 - What measures are being taken to control the introduced pest? Use the internet and try typing in 'crimp or marine pest' into your search engine.
- Use the internet to search for marine pest. Find out what organisations help protect marine creatures and what they do.
- Try typing in 'surfrider' into your search engine.

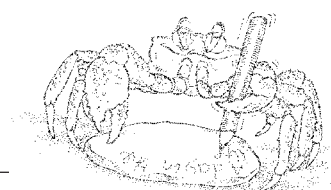


Cool web site

www.marine.csiro.au/crimp/



Learning outcomes



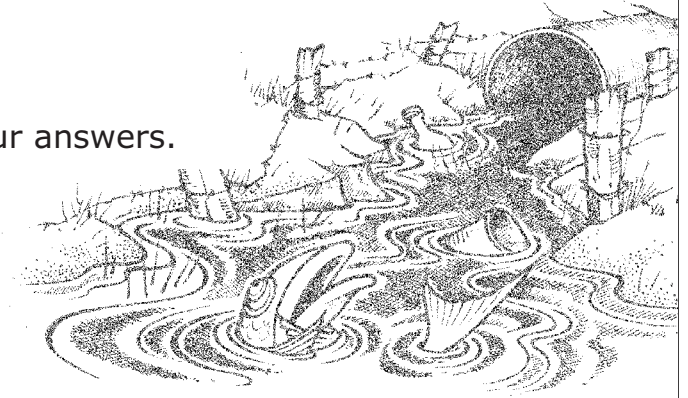
Activity	KLA	Outcome
1 Risky business - p35	Science SOSE	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
2 Sea creature poetry - p36	English SOSE	WRITING – 4.11 Controls most distinguishing linguistic structures and features of basic text types such as stories, procedures, reports and arguments. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
3 Word - out postcard - p37	Science SOSE	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
4 Get involved - p38	English Science	WRITING – 4.10 Adjusts writing to take account of aspects of context, purpose and audience. LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem.
5 Sea creatures at risk - p39	Science	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem.
6 Sensational seagrass - p40	English SOSE	WRITING – 4.9 Uses writing to develop familiar ideas, events and information. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
7 Sea turtles at risk - p41	Science SOSE	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
8 To Make a long story short - p42	English	WRITING – 4.11 Controls most distinguishing linguistic structures and features of basic text types such as stories, procedures, reports and arguments.

Name: _____

Risky business

Quick quiz - Use your book to check your answers.

Name five sea creatures at risk.



List some threats to these sea creatures.

Describe three ways that you can help protect sea creatures and their habitat.

1. _____

2. _____

3. _____

True or false (circle one)

The biggest threat to sea creatures is getting caught in fishing nets T F

Orange roughy fish live up to 150 years old T F

Dugongs can die from drowning in seagrass T F

Only fish get affected by pollution and rubbish T F

Coral survives best when the water temperature rises T F

Picking up litter on the beach helps creatures in the sea T F

Factories are responsible for all pollution and rubbish T F

Did you know!

The amount of fish harvested in the world is more than that of cattle, sheep, poultry or eggs!

Name: _____

Sea creature poetry

1. Write a haiku poem based on a sea creature at risk. Remember haiku has three lines. The first line has 5 syllables and answers the question where? The second line has 7 syllables and answers the question what? The third line has 5 syllables and answers the question when?

e.g. Amongst the seaweed
Hides a weedy seadragon
Camouflage all day

In the deep dark sea
The beautiful green turtles
Belong forever

2. Write down the name of a sea creature at risk.
Write a poem or descriptive story about that sea creature using each letter of its name.

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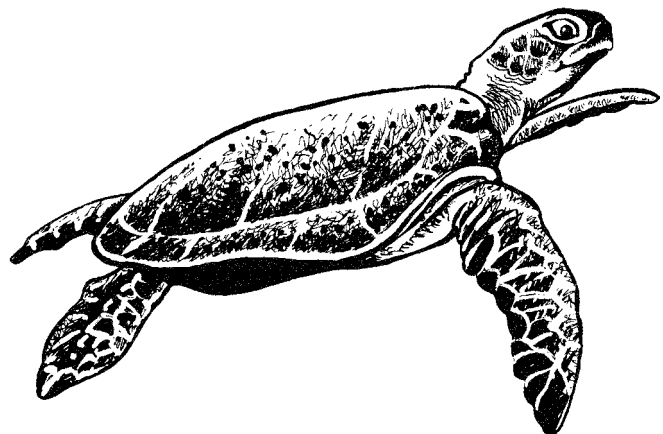
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Name: _____

Word-out postcard!

This is best done when the students have some background knowledge about threats to the marine environment.

Begin with a focus discussion as a class:

- How would they describe the ocean to someone who has never seen it?
- What is their favourite sea creature?
- What do they think is special about the oceans?
- Why would they like to see all the beaches clean and free of pollution?
- Share with them the idea that they can make a difference by spreading the word about what they have learned about the ocean and how to protect it.

Based on the discussion, have each student decide on one aspect that they would like to share with someone else using their word-out postcard. Brainstorm a list of potential people they can send their word-out card to. (Councils, premier, prime minister, relatives etc.)

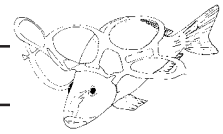
Step 1: Have the students write a draft of what they want to write and check it before the students write on the actual postcard.

Step 2 : Have the students draw a picture of their message on the front of the postcard. Encourage students to be creative and help show off their special message!

Step 3: When the students have finished, either mail the postcards as a group or allow them to hand deliver them.

Allow students to show off their postcards with each other before sending them.

Don't trash the sea



Materials

- Scissors
- White card cut to postcard size
- Decorating materials - paints, scrap paper, pencils or colouring in pencils



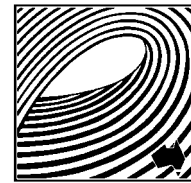
Get involved!

- Find out what organisations are involved in protecting sea plants and animals.
- Make a list of these.
- Write letters to these organisations to find out how you can protect whales, sea mammals and other sea habitats that may be at risk.
- Get your school to join as these organisations are voluntary and rely on memberships to reply to your letters.
- Share the information you found out about why they need protection and what people can do to help.
- As a class make up a contacts directory list of all the groups, people and organisations you found and include a brief description about what they do to help protect the sea.
- Write a letter to some of these contacts to find out more about what people can do to help.

Visit a web site



www.mesa.edu.au



Surfrider Foundation
AUSTRALIA
Conservation • Activism • Research • Education

www.surfrider.org.au



Find the words in the grid below

Find the words in the grid below



turtle

orange roughy

fishing line

oil

protected

save

dugong

sharks

plastic

caught

food

coral

learn

whale

birds

net

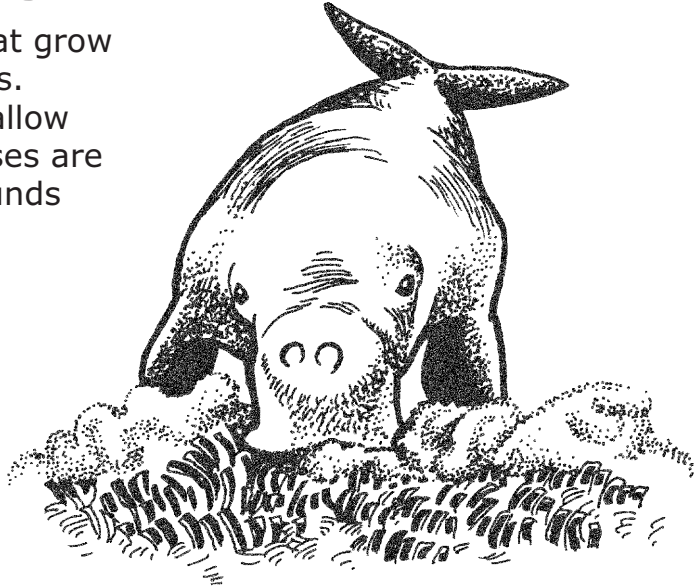
seagrass

seadragon

albatross

Sensational seagrass

Seagrasses are flowering plants that grow underwater in marine environments. Generally they are restricted to shallow waters in bays and inlets. Seagrasses are valuable breeding and feeding grounds for large numbers of fish and invertebrate species. Seagrass meadows in Australia are under threat. For species such as the dugong (sea cow) which feeds only on seagrass this is a major concern.



Do some research on seagrasses

1. Where are the seagrass meadows in your state?

- Draw a map to show the location of seagrass meadows in your state.
- If possible, visit this area or make some phone calls to organisations who may be monitoring it.

2. What type of seagrass is it? (There are 16 different types in Australian temperate water.)

3. What sea creatures live amongst the seagrass?

4. Is this seagrass under any threat? If so what are they?

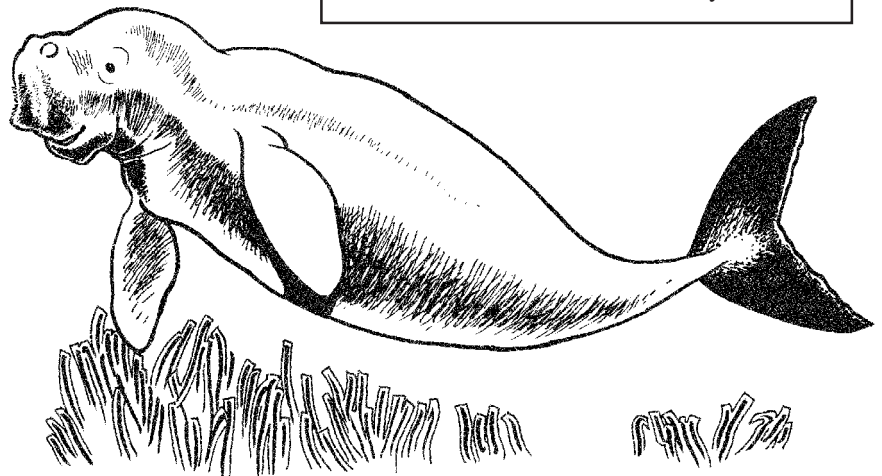
5. Make a brochure to distribute to the local community about the importance of seagrass in that area or design a poster to display.

Where to see seagrass meadows

WA	Marmion Marine Park near Perth, offshore from Jurien, Shoalwater Islands Marine Park and Rottnest Island and around Albany
NSW	Jervis Bay, Botany Bay
Victoria	Most of Melbourne's bayside beaches, Flinders in Western Port, Corner Inlet and Portland Bay
Tasmania	Bays off the northern and eastern coasts and Flinders Island
SA	Spencers Gulf and Gulf of St Vincent and Kangaroo Island
Qld	Hervey Bay, Hinchinbrook Channel, Moreton Bay

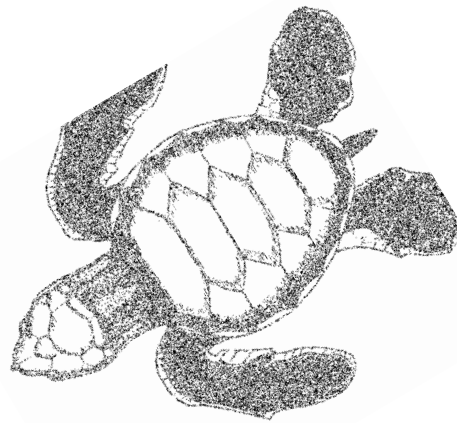
Did you know?

The anchor from one cruise boat can destroy an area of seagrass the size of a football field!



Sea turtles at risk

Sea turtles are at risk from many things. Playing the following game will help students learn experientially, how difficult it is for a sea turtle to survive with so many threats facing them.



Activity

- This is an active game of tag that requires some space and may be best done outdoors.
Ten students are chosen to represent the threats to the turtles and the rest of the students are turtles (see below).
- The aim is for the turtles to successfully make it through the obstacle course to safety. If turtles are tagged or caught they must die. Designate some students before the start to become another threat if they die. i.e. they would join one of the existing threats.
- The layout of the "threats" and start of the turtles is important. (see below)
- Discuss the issues and role of pollution, natural predators and humans in their survival after the activity.

(P = Predators) Two students stand stationary in a cardboard box and try to touch the turtles as they make their way to sea.

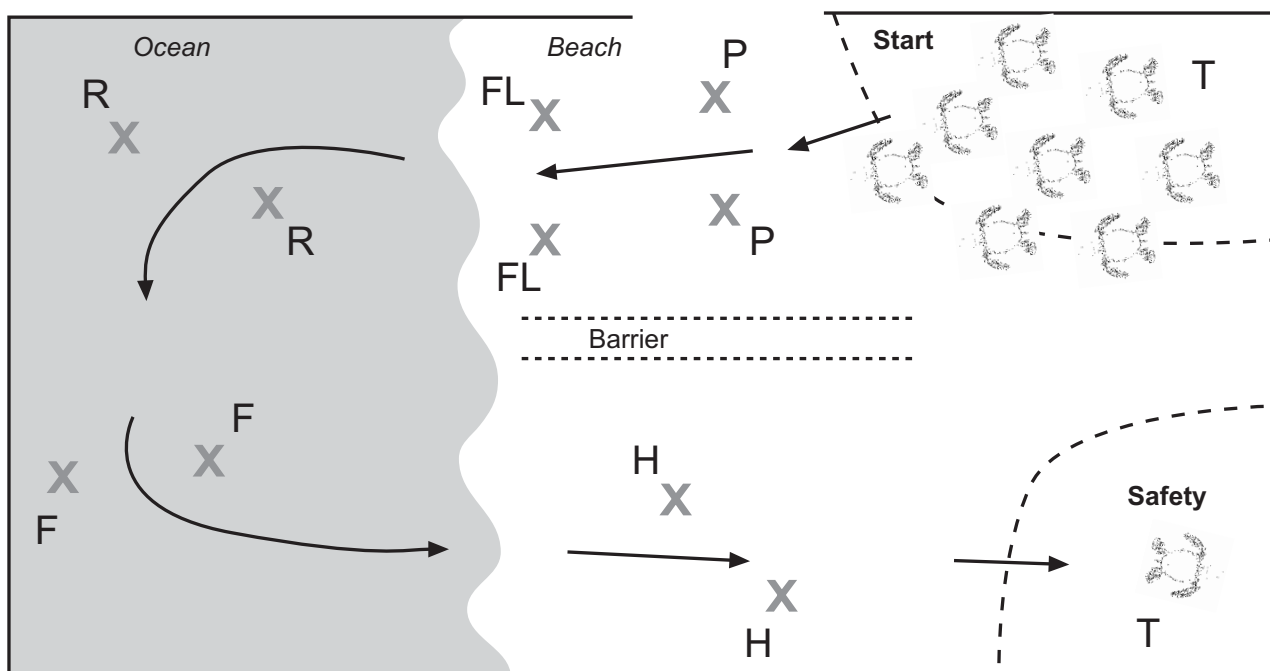
(FL = Fishing line) Two students wave a skipping rope on the ground to simulate a fishing line in the water which a turtle can get caught in. Turtles must jump over the skipping rope and try not to touch (get caught in) the fishing line on their way to the sea.

(R = Rubbish) Two students stand stationary and wave plastic bags, representing rubbish in the sea. Turtles often mistake these for sea jellies. If a plastic bag touches a turtle it "dies".

(F = Fisher person) Two students hold a towel or sheet (to represent a net). The turtles must pass without getting the net thrown over them. The fishers monitor who gets caught.

(H = Hunters) Two students stand stationary and try to hunt the turtles as they run by them. If a hunter touches a turtle it "dies".

(T = Turtles) The rest of the students are turtles and must make it through the obstacle course to survive.



To make a long story short....

Write a story that contains at least 12 of the following terms.

Oil pollution, hunted, fishing nets, turtles, bin, food, protected, plastic bags, whales, save, disappearing, sink, people, beautiful, extinct, ocean, boats, homes.



Book 17

Better Boating Behaviour

Before reading the book

- Ask students if they have been on a small motor boat. Find out whom they went with. Why did they go on the boat? Did they have a good time?
- Who has not been on a small motor boat? Who would like to go on one? Do they think it would be pleasant? When might it not be pleasant on a small boat?

After reading the book

- Relating to past experiences in boats can students remember anything about safety equipment on board the motor boats? Ask them why it's important to have safety equipment? Which items of safety equipment were mentioned? What can be the consequence of not having the equipment in an emergency?
- Use the index to cross-reference the major items of safety equipment and discuss ways in which safety equipment is used.

Other suggested activities

PFD's (Personal flotation devices)

- Borrow a number of PFD's. They should be the appropriate size for your students, except one should be much too large. Ask each student in turn to put on the PFD. They might like to do their own version of a steward in an aircraft demonstrating safety equipment.

Using the large PFD ask a student that is far too small for the jacket to put it on. Ask the students to raise their two arms vertically. Grab the shoulders of the PFD and it should easily slide off the student. Look at the materials that are used to make a PFD. What does a PFD have so it stays on and will help a person's head float out of the water?

- Try a PFD out in the pool. Look at the pictures on Page 7 of the reader - *Better Boating Behaviour* and contact an ANZSBEG member (see page 47) to find out who could come to your school to show students how to jump into the water with a PFD correctly.

- Go Boating!

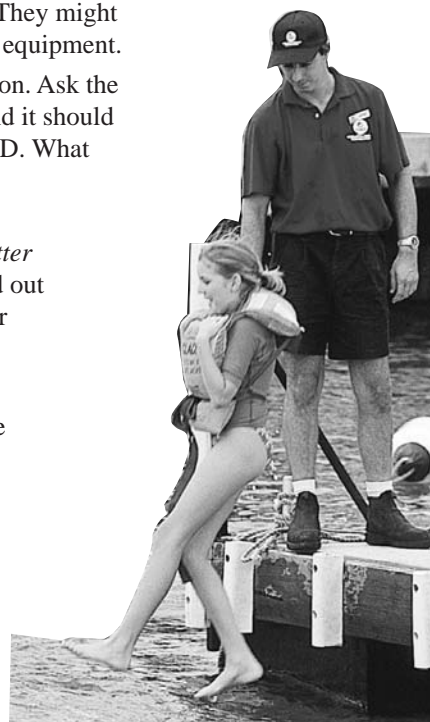
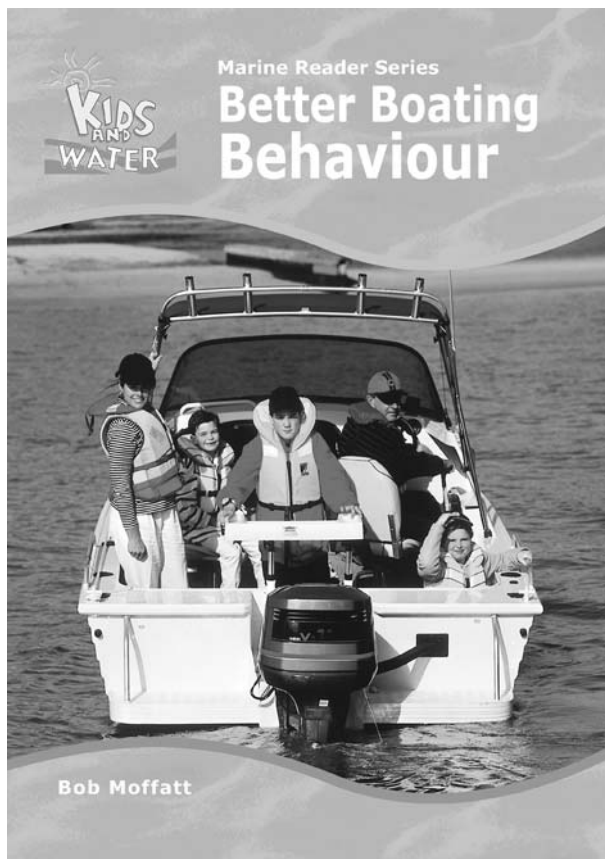
Organise for the class to go out on a boat to experience it first hand or invite a boat to school.

When you are on board check out all the safety gear. What type of equipment did they have for safety on the boat? How many PFD's were there? Discuss an emergency on the boat. What type of emergency could occur? What actions would be taken following this emergency? Would you know what to do? Find out from the skipper of the boat.

- ANZSBEG Kids in Boats

Free copies of 14 activities on boating can be downloaded from :

www.anzsbeg.org.au

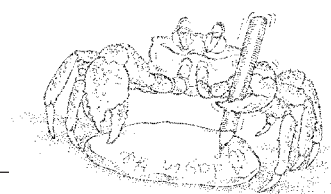


Contact an ANZSBEG member (see page 47) to find out who could come to your school to show students how to jump into the water with a PFD correctly.

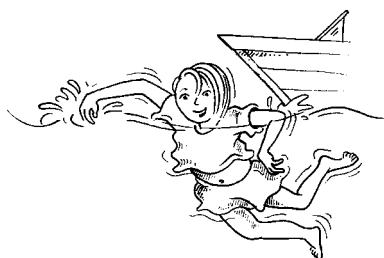
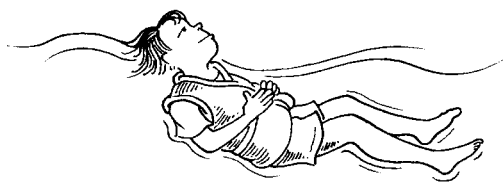


Australian and New
Zealand Safe Boating
Education Group

Learning outcomes



Activity	KLA	Outcome
1 Think fast - p45	English Health & PE	SPEAKING AND LISTENING – 4.1 Interacts confidently with others in a variety of situations to develop and present familiar ideas, events and information. SAFETY – 4.12 Assesses options and consequences in responding to unsafe situations.
2 Safety equipment information - p46	Health & PE Technology	SAFETY – 4.12 Assesses options and consequences in responding to unsafe situations. SYSTEMS – 4.9 Identifies the relationships between elements in systems (people and components) and some of the sequences through which the elements work.
3 Know know know your boat - p47	Health & PE SOSE	SAFETY – 4.12 Assesses options and consequences in responding to unsafe situations. NATURAL AND SOCIAL SYSTEMS – 4.14 Describes how rules and laws are made.
4 Weather maps? - p48	Science SOSE	EARTH AND BEYOND – 4.2 Identifies changes in the atmosphere and the interior of the Earth that cause catastrophic events. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
5 Close up on a fire extinguisher - p49	Science Technology	NATURAL AND PROCESSED MATERIALS – 4.10 Identifies factors that determine the choice of materials for particular purposes. SYSTEMS – 4.9 Identifies the relationships between elements in systems (people and components) and some of the sequences through which the elements work.
6 Boating letters - p50	English	WRITING – 4.9 Uses writing to develop familiar ideas, events and information.



Think fast

- Place all the items of safety equipment on a table in the middle of the room.
- Leave the equipment on display for about one minute and have the students study it.

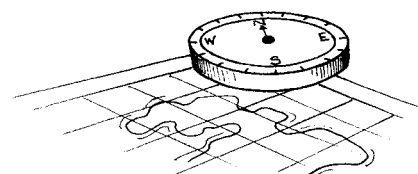
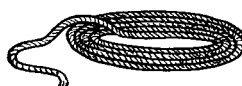
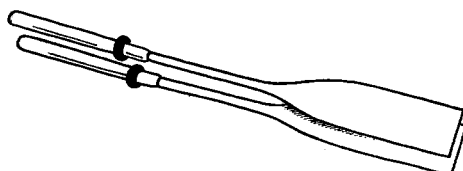
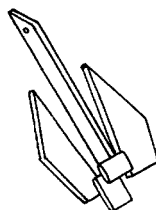
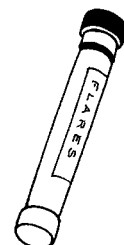
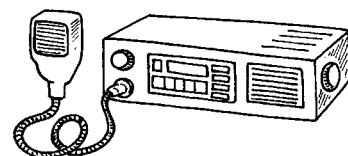
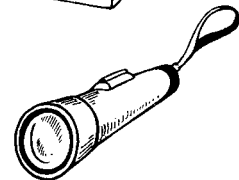
Cover the equipment with a sheet and ask the students to write down as many items as they can recall.

- Talk to the students about each piece of equipment and its use. Begin with those recalled and end with those not remembered.

Materials needed

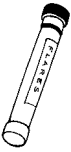

- Safety equipment from a motor boat and other items that may be taken on a short boat trip. For example sunscreen, hat, towel, fishing rod.

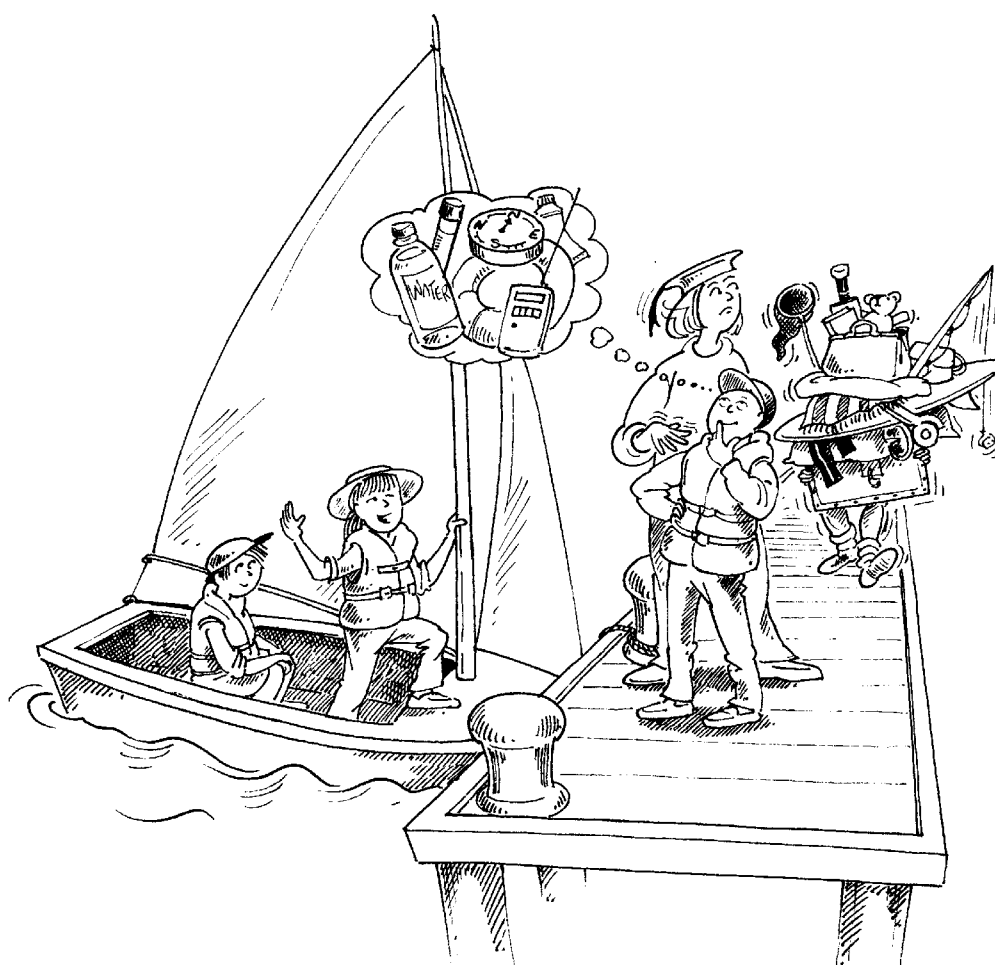
Including first aid kit, PFD's, flares, small fire extinguisher. The bigger the range the better.



Safety equipment information

Make up a wall chart of boating safety equipment. Use your reader to complete the chart and the icons on page 45 to complete the chart. You can also write to the boating safety authorities listed on page 47.

Type of safety equipment	How to use the equipment	When to use the equipment
 Flare	Read instructions. Red at night, smoke by day.	Boat has broken down and is floating out to sea, another boat is in distance and you need to attract attention.
		



Know know know your boat

Each country, state and territory has published Boating Safety Guides which provide information on boating safety, rules and regulations. Search the internet for contacts or write to the appropriate authority at the address below for a class copy of the local regulations. Build up a class set containing an example from each authority listed. Note any differences in rules and regulations between the authorities. Why are there differences? Consider the problems that may arise for boat users where there are differences. How could these problems be overcome?

ACT

Australian Maritime
Safety Authority
PO Box 1108
Belconnen ACT 2617
www.amsa.gov.au

QUEENSLAND

Marine Safety Program
Queensland Transport
PO Box 2595
Brisbane QLD 4001
www.transport.qld.gov.au

See also:

Queensland Boating and Fisheries Patrol, Water Police
and Queensland Transport Customer Service Centres

NEW SOUTH WALES

Waterways Authority
PO Box R228
Royal Exchange
Sydney NSW 2000

VICTORIA

Marine Board of Victoria
PO Box 2797Y
Melbourne VIC 3001



**Australian and New
Zealand Safe Boating
Education Group**

SOUTH AUSTRALIA

Recreational Boating Services,
Department of Transport
PO Box 205
Port Adelaide SA 5015
www.transport.sa.gov.au/marine.htm

WESTERN AUSTRALIA

Maritime Division, Department of Transport
PO Box 402
Fremantle WA 6160
www.transport.wa.gov.au/maritime

Find out about the AQUASAFE
Program and *Skip* the water safe
pelican



NORTHERN TERRITORY

Marine Branch, Department of Transport and Works
PO Box 2520
Darwin NT 0801
www.coburg.nt.gov.au/dtw/public/marine/

NEW ZEALAND

Small Boat Safety,
Maritime Safety Authority
PO Box 27006
Wellington NEW ZEALAND

Use the addresses to write
for a boating safety
information pack.

Also visit their web site
www.anzsbeg.org.au
and download the kids in
boats project



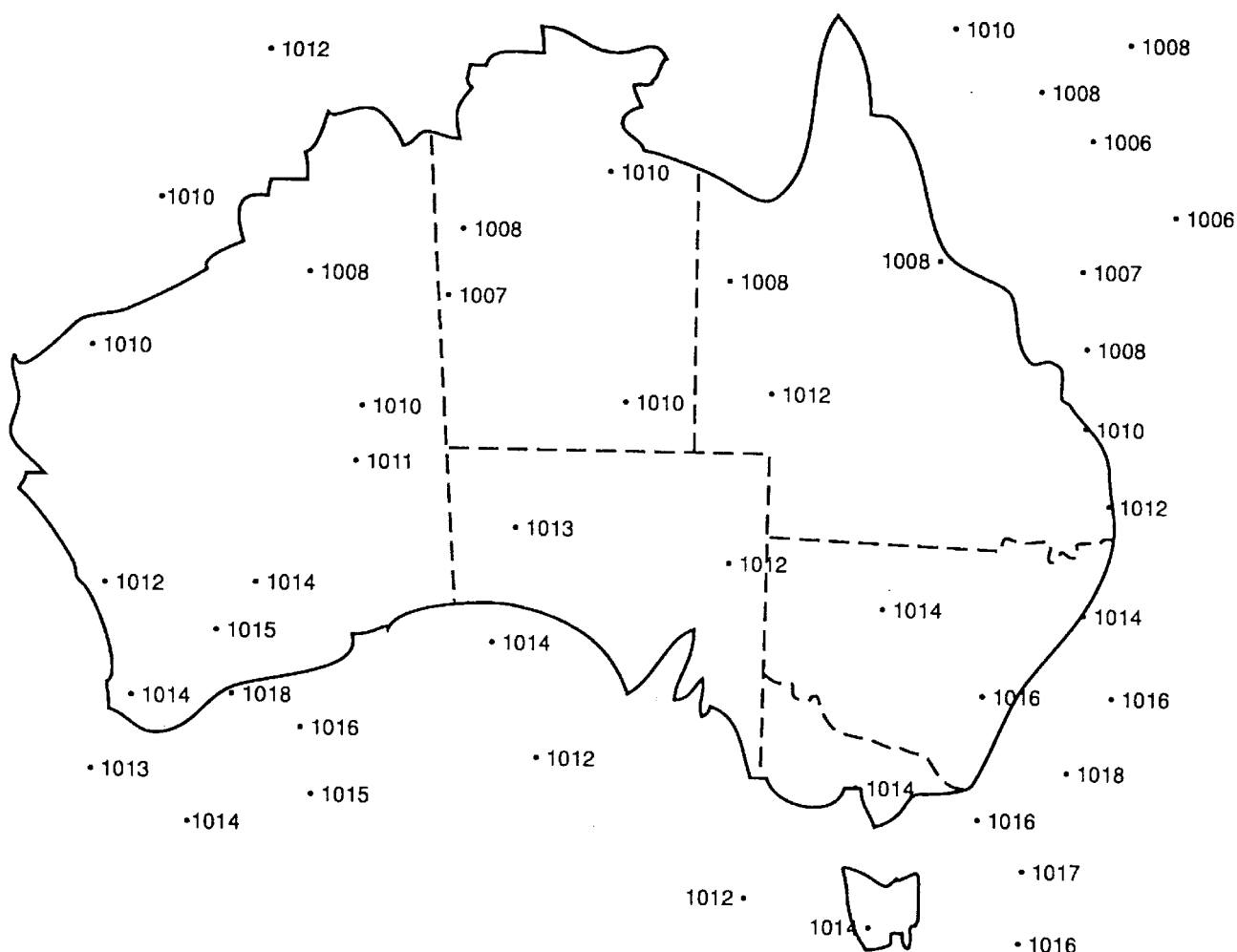
Weather maps

The weather is very important when you are thinking about going out in a boat. Going out in bad weather or making a wrong decision could be very dangerous.

Do the following exercise to find out more about a weather map.



1. On the map below the atmospheric pressures have been measured at different locations around Australia. Attempt to connect points that have the same pressure. These lines are called isobars.
2. Compare your placement of the isobars on your map to other class members. Is there any difference? Is there good reason to believe that your placement of the isobars is any better than others? Is there any additional information that may assist you to make a better judgement?
3. How accurate do you think your weather map is? Look at other weather maps to find out what other information they have to tell us about the weather.
 - Collect weather maps each day from the newspaper over the period of a week.
 - You can get a weather fax by calling telstra (check your phone book for the most current number).
4. What other things do weather maps have on them to tell us about the weather?
 - Look at the changes to the map each day.
 - What would people going out in boats need to consider before going out on these days? What decisions might they need to make?



Close up on a fire extinguisher

- Discuss how fire extinguishers are used.
- Explain that the three types of fires referred to on extinguishers are burning solid substances, liquids and electrical.
- Different extinguishers have different chemicals to put out the various kinds of fires.

Activity

- Ask students to locate fire extinguishers around the school and find the following information.
- Ask students not to handle the extinguishers or remove them.
- Students will need to complete this in their workbook.



- Q1. What do the instructions say on the fire extinguisher?
- Q2. What kind of fire can the extinguisher put out?
- Q3. Would it put out an electrical or petrol fire on a boat?
- Q4. How heavy is it when it is full?
- Q5. How heavy is it when it is empty?
- Q6. When was the extinguisher last checked?
- Q7. Does the extinguisher have any special markings to identify it from other types of fire extinguishers?



School marine safety day

1. This activity must be done with suitably qualified officers, must not be attempted alone and may involve a local high school who does marine studies, or a number of primary schools in a local area.
2. Acknowledgement is given to the Marine Teachers Association of Australia (MTA), its members and the Department of Transport for the creative ideas of this activity. All the ideas for the marine safety day come from the marine olympics manual. A full copy of the Marine Olympics manual is available from your State ANZSBEG representative (See page 47).

Event 1 RFD inflation display

Aim

To see how to inflate a liferaft (RFD).

Event 2 PFD activity

Aim

To put on a life jacket, swim out to a life raft and get into the life raft.

Event 3 Flare display

Aim

To let off smoke flares as shown on page 14 of your book *Better Boating Behaviour*. The flare display gives students a chance to let off a flare and to see the effects.

Event 4 Ambulance display

Aim

To see basic rescue equipment and meet an ambulance officer.

Event 5 Radio operation demonstration

Aim

To see basic radio equipment as shown on page 9 of your book - *Our Day on a Research Boat* and meet a marine radio operator.

Event 6 Firefighting

Aim

To see basic firefighting equipment and have a go at putting out a fire.

Event 7 Life raft procedures

Aim

To capsize and right a life raft and climb aboard while wearing a life jacket.

Event 8 Iron mariner and iron maiden

Aim

To compete a course using physical skills necessary for marine safety with elements of fun.

Event 7 Knot tying

Aim

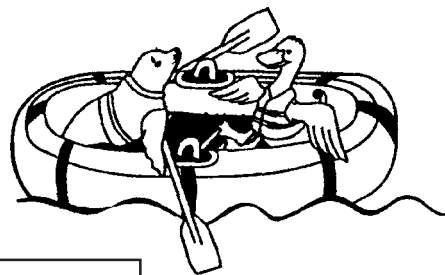
To use knots and rope work useful in the marine environment.

Boating letters

This can be played in small groups or as a class.

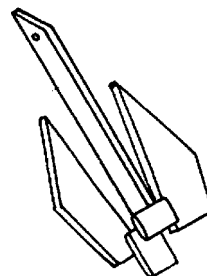
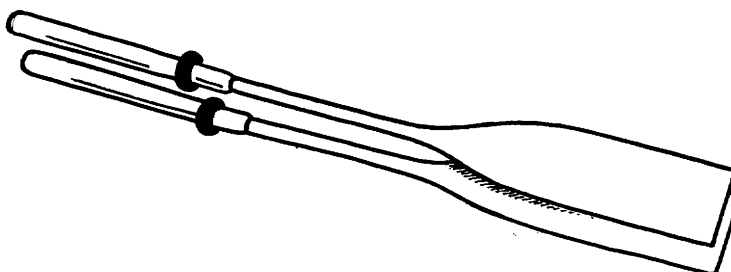
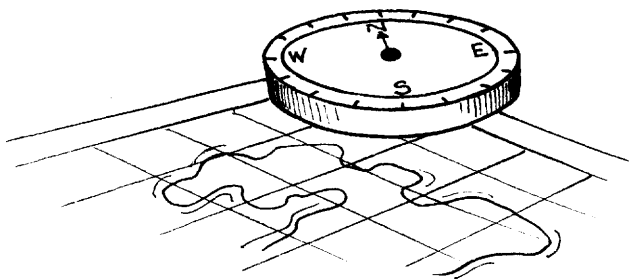
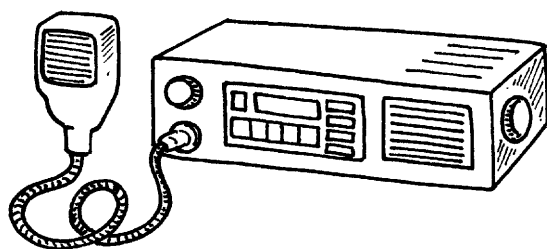
Students are given a letter of the alphabet and must try to think of a word relevant to boating in the following categories.

Boat	e.g. anchor, catamaran, personal water craft
Weather	e.g. awful, cloudy, stormy
Safety	e.g. advise, others, careful, swim well
Water	e.g. aqua, calm, surges
Danger	e.g. accident, collision, swamped



Further categories can be added

Activity from Kids in Boats www.anzsbeg.org.au



Answers to the worksheet on the bottom of page 56

Paper card	Orange peel	Milk carton	Nylon	Glass	Cigarette butts	Plastic	Tin
2-4 weeks	up to 2 years	5 years	20 - 40 years	Indefinitely	1-5 years	10 - 20 years	50 - 100 years

Book 18

Don't Mess with the Sea

Before reading the book

- Use pictures from magazines or a poster representing a problem that connects litter and pollution with the marine environment. For example a picture of a sea creature with a plastic ring caught around the neck or fishing line tangled around a seabird.

Ask the students to describe what they see.

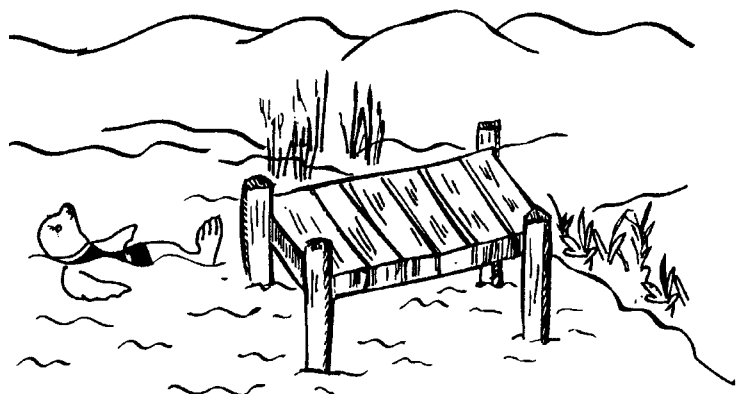
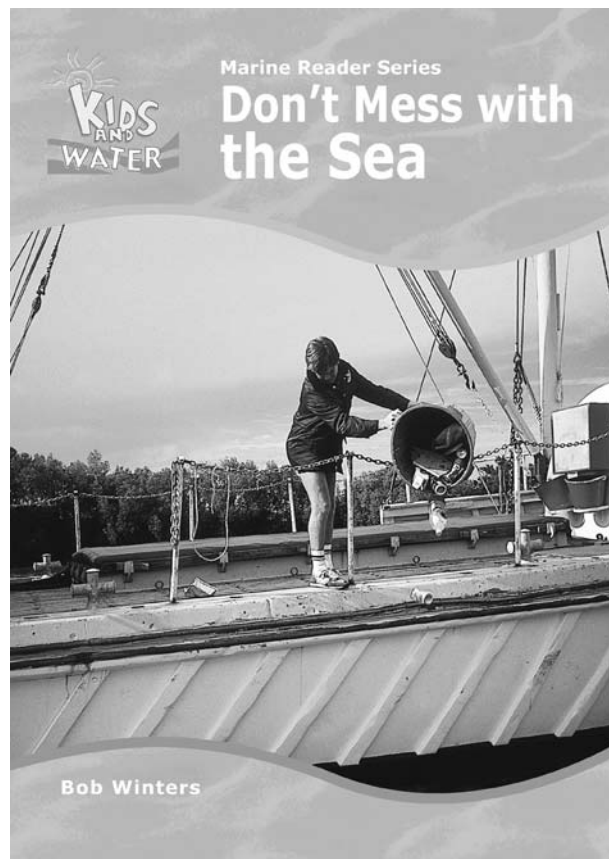
- Have the students brainstorm in small groups on large sheets of paper what types of litter and pollution are entering our marine environment.
- Have the students brainstorm how the litter and pollution gets into the sea.
- Have each group present their ideas to others in the class.

After reading the book

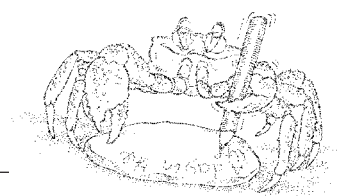
- Share and recall information about the text.
- Refer to the index for the use of unfamiliar terms.
- Discuss the brainstorming results prior to reading the book, to those discussed after reading the book. Was there anything they did not think of?
- Discuss how litter gets into the sea and what we can do to prevent it.

Other suggested activities

- Use the internet to research marine pollution issues further.
- Fascinating sea facts can be found at www.abc.net.au/oceans/facts/default.htm on marine parks and pollution.
- Have the students design a 'Pooper Scooper' for picking up after a dog.
- Marine life report card. Research a marine species and find out about its habitat, ecosystem, and how it could be affected by litter and pollution. Write a report card for the survival of this species.
- Organise a beach clean up day. Construct a survey sheet to categorise the types of rubbish you collected. Where is most of your rubbish coming from?
- Investigate MARPOL. This is an international agreement that deals with marine pollution. What materials are legally allowed to be dumped in the ocean and which are not? What are the penalties?
- Find out where ocean outfalls are in your area or where you go to the beach. What are the opinions of people who live, swim, fish or surf in this area. Design a survey.



Learning outcomes



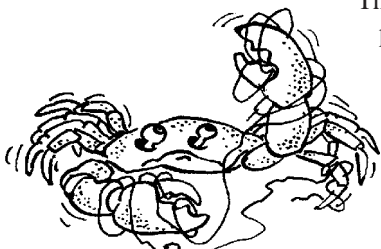
Activity	KLA	Outcome
1 Solid waste - p53	Health & PE SOSE	HEALTH OF INDIVIDUALS AND POPULATIONS – 4.9 Identifies and analyses images of health and how these influence personal and community health goals. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
2 Connected to the sea - p54	Science SOSE	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
3 Pollution monitoring - p55	SOSE	TIME, CONTINUITY AND CHANGE – 4.6 Describes different views of individuals and groups about issues related to the care of places. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
4 Pollution solutions - p56	Science SOSE	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
5 Rubbish track to the sea -p57	Health & PE SOSE	HEALTH OF INDIVIDUALS AND POPULATIONS – 4.9 Identifies and analyses images of health and how these influence personal and community health goals. RESOURCES – 4.10 Describes factors that affect resource use and development.
6 Oil and feathers don't mix - p58	Science	NATURAL AND PROCESSED MATERIALS – 4.12 Recognises and describes conditions that influence reactions and change in materials.
7 Marine entanglement - p59	Science	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem.
8 What future? - p60	Science SOSE	LIFE AND LIVING – 4.7 Identifies events that affect balance in an ecosystem. NATURAL AND SOCIAL SYSTEMS – 4.13 Describes responses of different elements (including people) to changes in natural systems.
9 Local news! - p60	English The Arts	WRITING – 4.10 Adjusts writing to take account of aspects of context, purpose and audience. VISUAL ARTS – 4.22 Selects, combines and manipulates images, shapes and forms using a range of skills, techniques and processes.

Solid waste

"Many types of materials are either dumped directly into the ocean or enter the ocean from the land being washed down with rain and stormwater. These heavier materials soon sink and accumulate on the bottom of the sea and ocean floor.

The most obvious solid materials to have an effect on the oceans are **plastics**. Plastics are now found in all parts of the worlds oceans including Antarctica. Dumping plastics at sea is illegal but most plastics enter the oceans from the land.

Most plastics float and do not easily break down. Because of this they are often encountered by marine life. Plastics, such as nets, fishing lines, and plastic bags, may entangle animals and trap them until they die. Also plastics including raw plastic pellets, cigarette butts, and even plastic bags are mistaken by sea creatures for food items and are eaten, leading to death through choking or through starvation as the sea creature thinks they are full and do not search for food.



The solution to the plastics problems of the oceans would be much less if we all remembered to reduce, reuse and recycle on the land. We must litter less. We can also play an active role in community cleanups along the coast. Encouraging industry and governments to reduce plastic losses at sea, whether by agreement or by laws, is also needed to reduce further the effects of plastics on the marine environments.

The planet's toilet


Most human wastes are disposed of in water. In many parts of the world, including some parts of Australia, raw **sewage** is simply pumped into rivers or directly into the ocean with little treatment. The idea of disposing of our wastes in this way is to dilute the wastes down so that they have little effect on the environment or on peoples' health. These methods may have been satisfactory when the earth's human population was smaller. Now the quantities of sewage entering the seas and oceans is enormous and in some places it is contaminating food sources such as shellfish and fish with dangerous disease-causing organisms. Sewage also contributes large amounts of nutrients to coastal waters. Many Australian cities and towns have excellent methods of treating



sewage so that pollution of waterways and the sea is minimised. Other cities need to find other ways for disposing of their wastes including processing and reusing materials on the land.

The invisible pollutants

In addition to the visible materials that enter our sea there are a wide range of **chemicals** and other dissolved materials that enter the ocean as waste from our houses, factories, businesses and farms. Many of these are also carried by water. However, air pollution is responsible for almost one third of the toxic contaminants and nutrients that enter coastal areas and oceans. In Australia there are over 50,000 chemicals in use with many hundreds of new ones being added each year. Very few of these have been studied in detail to see if they have an effect on ocean life. Some such as pesticides, and heavy metals like lead, mercury and cadmium, are known to build up in the bodies of marine animals and through their concentration in the food chain to affect the health of humans that eat contaminated animals.



A good example of this is found in Victoria where sharks are sold as flake in fish shops. Because of high levels of mercury found in these top predators, sharks over a certain length have been banned from human consumption. **Fertilisers** from farms and sewage from homes provide a rich source of nutrients that contribute to the rapid growth of algae. Some algae grow rapidly and eventually decompose using up all the available oxygen in the water. Where the Mississippi River enters the Gulf of Mexico there is a lifeless area called 'dead zone' on the bottom of the sea that is more than 6000 square kilometers. This has been caused by the growth and decay of large amounts of algae growing due to vast quantities of nutrients drained from more than 40 percent of the mainland United States.

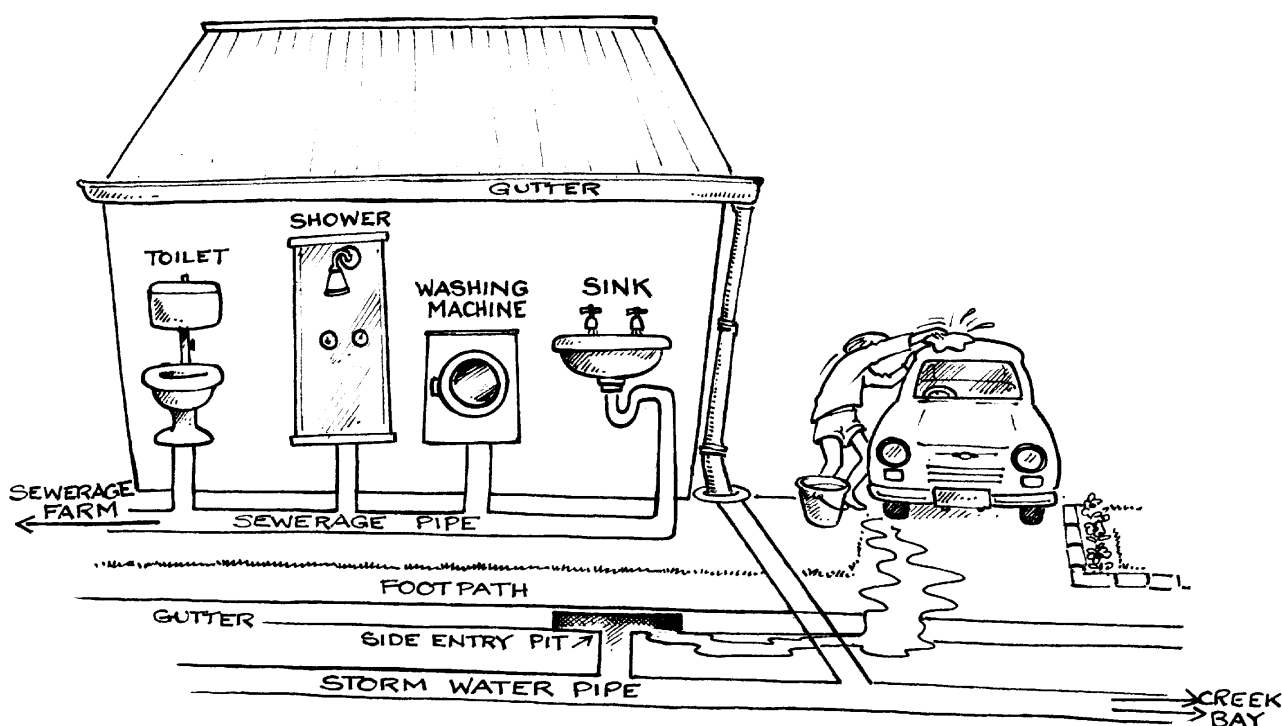
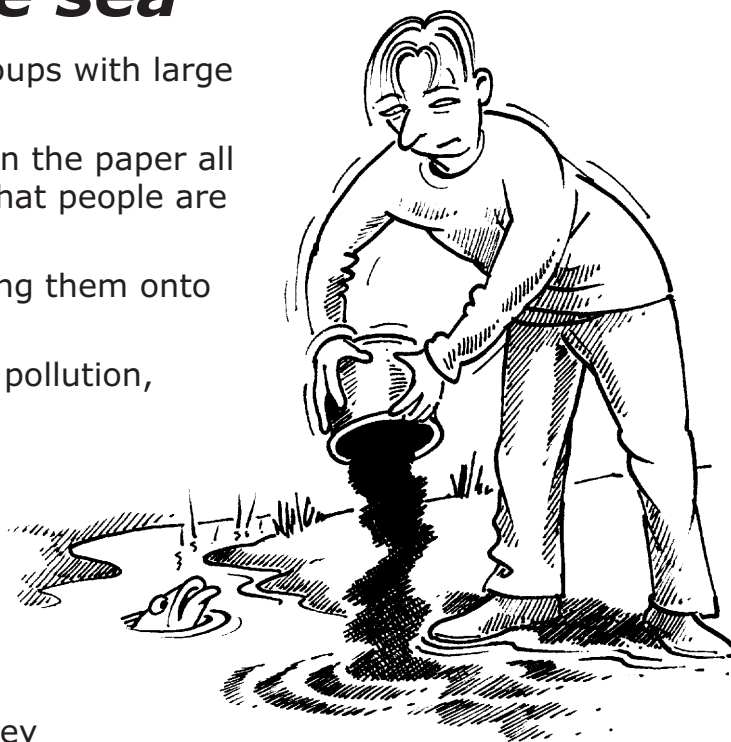
Much work is being done in Australia to ensure that we do not develop the pollution problems that are the curse of parts of North America, Europe and Asia."

Reprinted with permission from *Exploring the Oceans* by Mark Rodrigue, Gould League Victoria, 1998.

Connected to the sea

Have the students work in small groups with large sheets of butcher paper to write on.

- Ask the students to write down on the paper all the ways that they can think of that people are connected to the sea.
- Discuss the ideas as a class writing them onto the board.
(Food, products, pleasure, work, pollution, transport, etc)
- Reduce this list down to how the students themselves think they personally are connected to the sea e.g. what products from the sea do they use at home? If they visit the sea, what do they do while they are there? What kind of impact do they have during their visit? (boating, exploring over the rocks, squishing rock pool creatures, dogs and collecting shells.)
- What happens to the water that goes down their drains at home?
- Even those who live far from the sea are still connected in many ways!



Pollution monitoring

Who monitors your pollution problems? Find out which organisations help to monitor and prevent pollution in your area.

See if you can find who can help out with the following problems.

Divide the class up into smaller groups to research one of the following case studies.

Have the students report their findings back to the class.

Make a brochure of the contacts. Distribute these to your local community.



Case study one

You head down the beach for the day with two friends. You notice that a huge pile of rubbish has been dumped right in the middle of the beach! Most of the rubbish is plastic but you notice old paint tins and petrol cans. There is too much rubbish for you to remove in a bag and there may be some dangerous items in there.

Who do you contact?

What will they do?

What will happen to the rubbish?



Case study two

It's low tide and you head to the beach for a swim. Your favourite place is the rocks near cool water. As you head out over the rocks you notice all the rocks are covered in a slippery black oil. You look into the water and notice the water has a layer of oil covering it. You can see some ships out in the water but are not sure if they have anything to do with the problem.

Who do you contact?

What will they do?

Who else will be involved?

How can you help?



Case study three

The storm has settled and you head to the beach for a walk.

A huge stormwater drain is gushing out rain water and rubbish into the ocean. Not far from here you notice huge numbers of dead fish washed onto the beach and many still half dead in the water.

Who do you contact?

What will they do?

Who else will be involved?

Is there anything you can do?



Name: _____

Pollution solutions

List 10 types of pollution that can harm sea creatures.

Write a sentence about how this type of pollution might harm a sea creature.

List some ways that you can think of that we can make sure our litter and pollution does not harm the sea creatures in their homes.

How long? - You guess!

Rubbish that goes into the sea can often still be around for many years to come!

Fill in the table below as to how long you think each item might take to break down in the sea!

Your guess on how long? (Ask your teacher for the correct answers).

Paper card	Orange peel	Milk carton	Nylon	Glass	Cigarette butts	Plastic	Tin

Teachers answers are on Page 50 of this book.

Rubbish trek to the sea

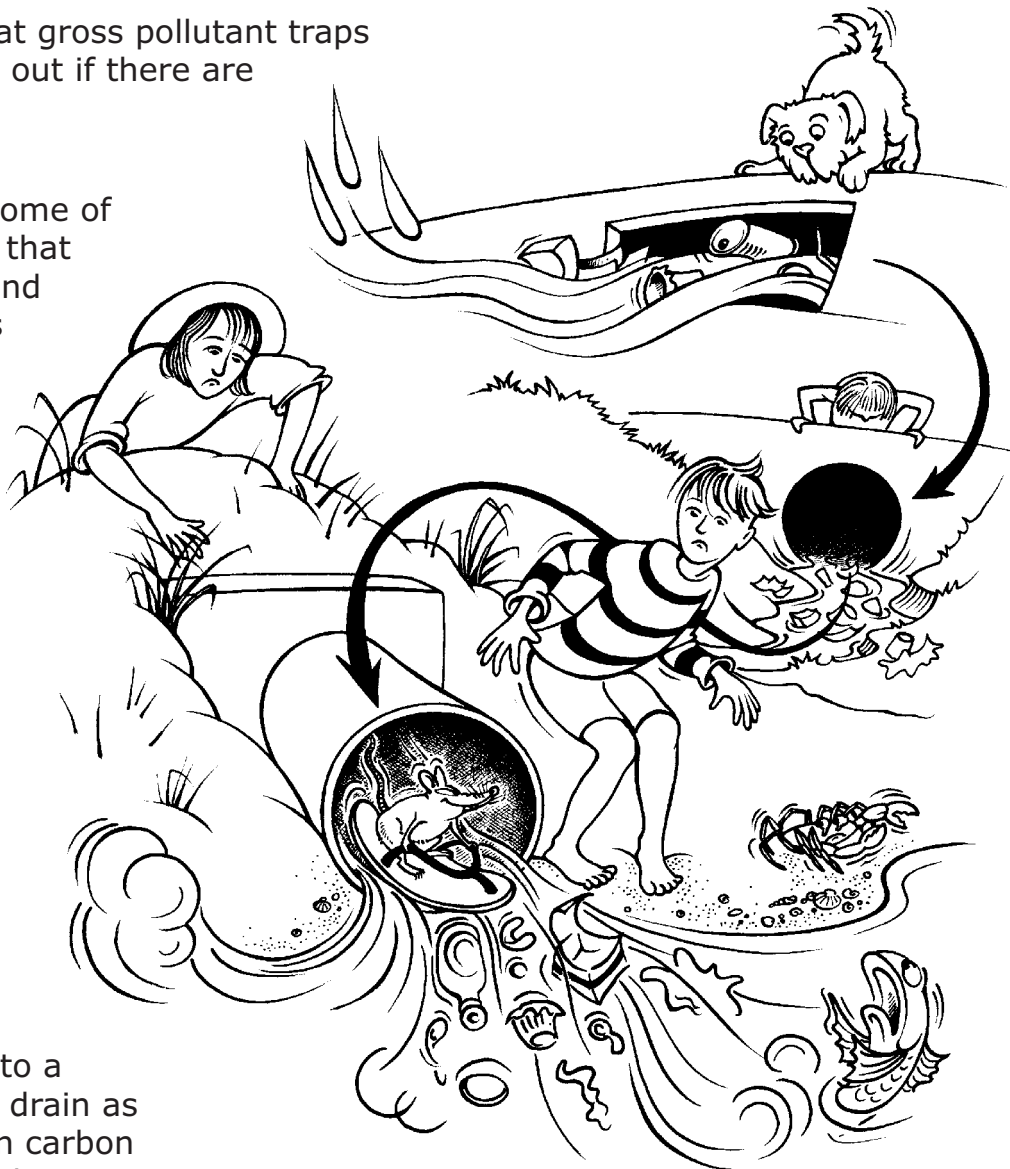
What happens to our rubbish that ends up on the ground and not in a bin. Where does it go after that?

- Make a visit to your local council/shire and ask for a map of your area's stormwater drain system.
- Find your home or school on the map and trace the path a piece of rubbish or a puddle of motor oil would take from your home/schools down through stormwater drains to the sea.

Sometimes you can see these stormwater drains. Visit one of these stormwater drains to see what they look like. How big are they? Is there any rubbish nearby, what else comes down these drains?

Find out what gross pollutant traps are and find out if there are any.

- Discuss some of the ways that rubbish and pollutants can get into these drains.



Warning

Never go into a stormwater drain as they contain carbon dioxide which can cause blackouts and death.

Name: _____

Oil and feathers don't mix!

Some large ships carry oil across our oceans. When there is an oil spill in the ocean many of the sea creatures end up dying because of it. In the following activity you will discover what happens to seabirds if they are caught in an oil spill zone.

Activity

Part 1

- Fill both glasses with clean water.
- Dip a feather into one glass and look into the glass.
- Pull the feather out.
- What did you observe? (The feather will be dry due to the natural oils and a layer of air trapped making the feather waterproof).

Part 2

- Make an oil spill by pouring some vegetable oil into the other glass of water.
- This oil will form a floating layer as it spreads out.
- Push the same feather into the oily water.
- What does it look like now? (The feather will be covered in oil. The oil has stuck to the natural oils in the feathers and clogged it. The feather structure has been damaged.)

Part 3

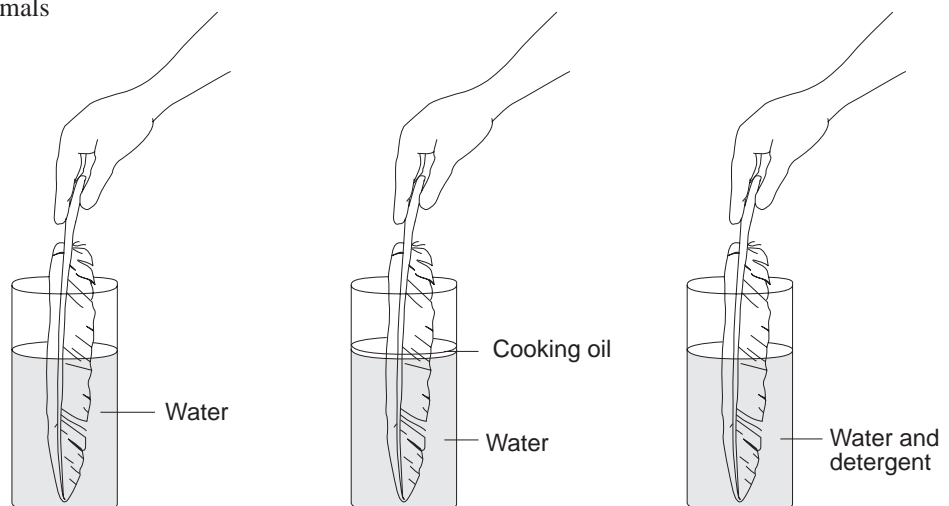
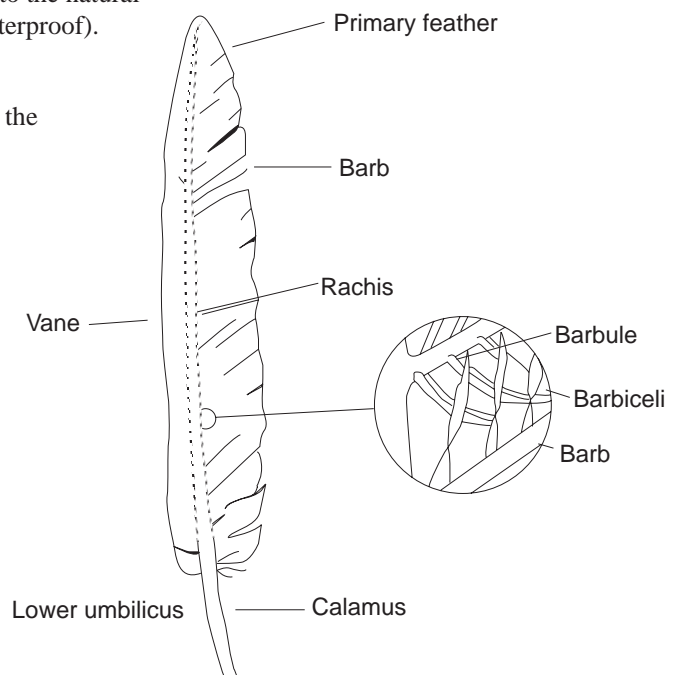
- Pour some detergent into the clean glass of water.
- With a new feather dip it into the soapy water.
- What did you notice? (The feather will be wet. It is no longer waterproof as the natural oils have been removed by the detergent. Its fine structure will not remain.)
- Draw up a chart to show your results.
- Dispose of feather and wash hands with soap. Dispose of cooking oil in a compost bin.

Further Discussion

- Ask students how oil spills happen?
- What coastal and marine animals are affected?
- How would an oil spill affect penguins and seabirds?
- Discuss why detergent is used to clean surviving seabirds after an oil spill.
- Discuss why seabirds are kept in captivity for a while before release back to the water.

Materials needed

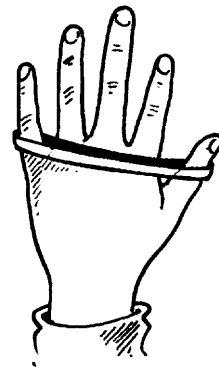
- Two large tall glasses of water
- 2 Seabird feathers
- Vegetable oil
- Liquid washing detergent



Marine entanglement

- Discuss some of the ways that sea animals can become entangled with litter in the sea.
- Use some pictures, magazines and posters to show what can happen.
- Discuss how entanglement can affect them. How does it affect their ability to get their food, swim and escape from potential predators?
- Places like zoos often rescue sea creatures that have become entangled in litter that has entered the sea. Find out about some of these and what happened.
- Can you imagine what it might feel like to be restricted in getting your food or moving? Use some small rubber bands to do the following quick exercise to help you imagine what it might be like.

Take a small rubber band and hook it over your thumb. Take the rubber band over the back of your hand and hook it over your little finger. Try to write, pick things up, comb your hair or scratch an itch!

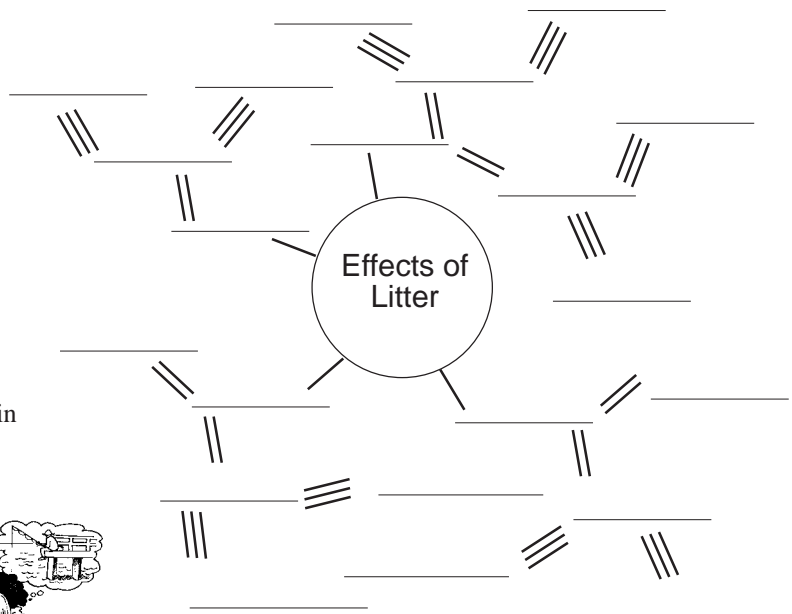


What future?

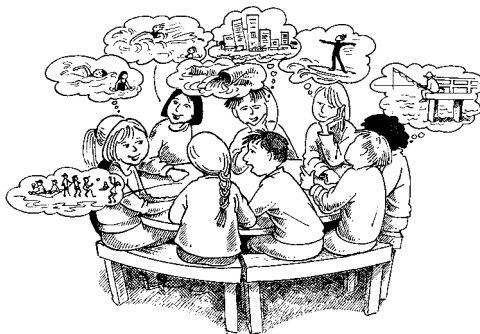
As a class discuss some issues involving sea creatures at risk. (Choose one that the students know a little more about. They may be more familiar with the issue of litter in the marine environment.)

Write this issue in the center of a large sheet of paper. Draw or paint some concentric circles around this point. (See diagram below)

1. Ask the question "What are the **immediate** effects or consequences?" Discuss what you think these might be and write them on the first line out from the centre. This shows that they are the first consequences to arise from this action or issue.
2. From these, have the students continue in small groups to discuss what consequences may follow on from the first ones. These second order consequences are then written on the next line and joined with a double line.
3. Third and fourth order consequences can be explored and written down in a similar way.
4. The result is a wheel of the future showing a range of possible consequences which might flow from one particular decision.
5. Students in their small groups can then present the different consequences to others in the class.

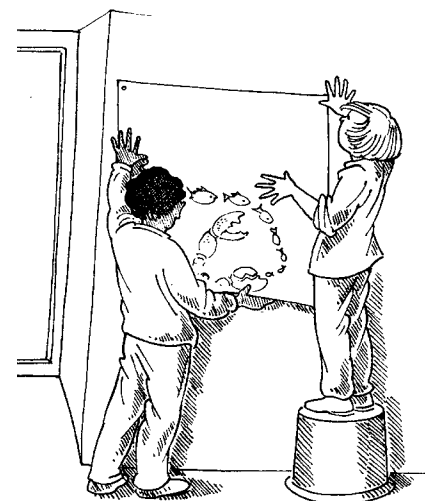


— First consequence
 == Second consequence
 === Third consequence



Local news!

- Design a pamphlet, postcard or poster to distribute or display to the local community about pollution and the marine environment in your area.
- Include things in the brochure like what the main problems are in your area and include simple lists of what people can do, e.g. pick up after their dogs, take their rubbish home from the beach, wash the car on the lawn, don't dispose of old paint or chemicals down the street drains or kitchen drains etc.
- Design a logo with your school name and class on it.
- Choose a nice day and distribute them to the community.
- You could also leave some in local shops for people to take.



Reading recovery level information

Method

Books 1-18 were read with a small sample of children (about 150) from a Primary School during March - June of 2001. Sample ages ranged from 5-10 years and were both boys and girls.



Results

The following reading recovery levels are only to be used as a guide until a more extensive sample size and test is conducted. The comments are from the reading specialist who has volunteered her time to Wet Paper

Level 1 Readers

Book 1 Everyone likes the sea:	Minimum level 10/11
Book 2 Sea Creatures:	Approximate level 13
Book 3 At the beach:	Minimum level 10 - 12

Level 2 Readers

Book 4 Fun by the sea:	Minimum level 12/13
Book 5 Working at Sea:	Approximate level 15
Book 6 Be safe at the beach:	Minimum level 12/13

Level 3 Readers

Book 7 Tourists and the Sea:	Approximate level 24/25
Book 8 All Kinds of Boats:	Approximate level 19
Book 9 Rock Pool Life:	Approximate level 30
Book 10 Creatures of the Deep:	Approximate level 20
Book 11 Shipwrecks:	Minimum level 26/27
Book 12 Our Day on a Research Boat:	Approximate level 28 Δ

Level 4 Readers

Book 13 Let's Go Sailing:	Approximate level 20
Book 14 Food from the Sea:	Minimum level 26/27
Book 15 Classification and Survival:	Approximate level 30
Book 16 Sea Creatures at Risk:	Approximate level 29
Book 17 Better Boating Behaviour:	Minimum level 21
Book 18 Don't Mess with the Sea:	Approximate level 28/29 Δ

Some comments

- The book contains lots of text changes with some complex vocabulary and a lot of visual analysis of unknown words is required, For example book 1.
- Language is easily accessible, however vocabulary makes it harder. For example book 2
- Although the pictures are good and give some support, they do not assist in working out with some complex vocabulary - Example: Many children may have difficulty with "squarking". For example book 3

Further information

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