



Curriculum

Module 3

Ocean Care

Section 2: Teaching and Learning Sequence

Suitable for Lower Primary to Middle Secondary

Core Learning Outcomes Levels 2 - 6

Developed by: Kathleen Gordon

In partnership with:



Queensland
Government
Department of
Education and the Arts



Association of Independent
Schools of Qld



Brisbane Catholic
Education



Qld Catholic
Education Commission



Earth
Charter

Ocean Planet: The need for ocean literacy

Discover amazing things about Earth’s oceans and how important they are to life on our planet

LEVELS 1 & 2

Focus question:

What do we know about ocean life?

Outcome:

Life & Living 2.3 Students make links between different features of the environment and the specific needs of living things

LEVELS 3 & 4

Focus questions:

What do we know about oceans?

How are living things in oceans connected?

Outcomes:

Place and Space 3.4 Students use maps to identify coastal and land features, countries and continents and climatic zones

Place and Space 4.4 Students use latitude, longitude, compass and scale references and thematic maps to make inferences about global patterns

Life and Living 3.3 Students make links between different features of the environment and the specific needs of living things

Life and Living 4.3 Students describe some interactions (including feeding relationships) between living things and between living and non-living parts of the environment

LEVELS 5 & 6

Focus question:

Why are oceans so important to life on Earth?

Outcome:

Place & Space 5.4 Students use maps, diagrams and statistics to justify placing value on environments in Australia and the Asia-Pacific region

OVERVIEW OF TEACHING AND LEARNING ACTIVITIES FOR THIS SECTION

Stage of inquiry	Activity/strategy	Levels	Resource sheets
Tuning in	Reading ocean stories Looking into mystery boxes	1-6 1-6	
Preparing to find out	Mapping what you know Introducing planet ocean Asking questions	1-6 1-6 1-6	Planet Ocean facts
Finding out	Discovering who eats who Discovering where animals live? Mapping the ocean planet Introducing The Global 200	1-6 1-6 3-6 5-6	Marine food chain and web Estuarine food web cards 1 & 2 Ocean energy cards Marine environments 1, 2 & 3 World ocean map Brinkx marine ecoregion hotspots
Sorting out	Playing an ocean quiz Preparing a report	1-6 1-6	Sample retrieval chart Sample report assessment
Going further	Inviting classroom visitors	1-6	
Making connections	Sharing data with another school		
Taking action			
Reflecting	Starting a reflection log	1-6	Sample reflection log

TEACHING AND LEARNING ACTIVITIES

READING OCEAN STORIES

Students listen to a traditional story about the sea or a creature that lives in the ocean.

- Prepare for this activity by reading and remembering a traditional tale about the sea or a creature that lives in the sea. Many cultures have stories such as these particularly sea faring peoples and those who lived by the sea. Your local library may have collections of traditional tales if your school library doesn't. Practise telling your story to a friend or family member before telling it to the students. You can read your story of course but try telling it without reading and you'll discover the art and power of storytelling. When you tell the story you may choose to use props. These are not necessary but can add colour to your telling. Be sure to vary the tone, tempo and volume of your voice for effect.
- Time the telling of your story so you finish just before a break if possible so the magic of the telling isn't broken by turning to a routine task. After you have told your story you may choose to invite your students, working in groups, to research and learn a story to tell to the class or to a younger group of students.

LOOKING INTO MYSTERY BOXES

Students are invited to guess the contents of mystery boxes using their sense of touch alone.

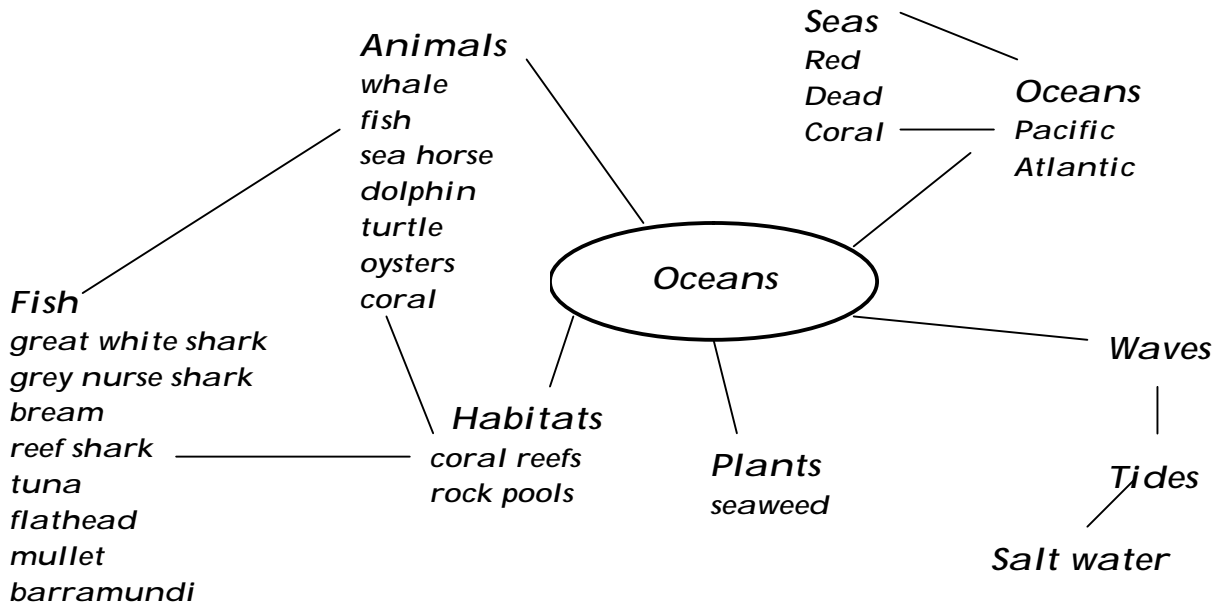
- Prepare six mystery boxes beforehand. First select six items for students to feel. The items you choose will depend on your students but could include: bivalve and mollusc shells, a cuttlefish bone, coral, driftwood, seaweed, salt and sand. Cut a hole, large enough for a hand to fit through, in one side of each box. Put an item in each box and close it up.
- Invite students to form groups of four or five and give each group a box. Challenge each group to guess the identity of their mystery item without looking at it. Encourage students to discuss their ideas in their group and come to some consensus about the item's identity if possible.
- At this point you could invite each group to report their guess to the whole class. Alternatively the boxes could be rotated so that each student has an opportunity to touch each object. This could be followed by the revelation of each item and clarification of the identity of each item if necessary.
- With each item now in plain view ask the students to suggest what the items have in common. This discussion can introduce our amazing oceans and the life they contain.
- If you have difficulty finding items to use or prefer a visual rather than tactile experience for students you could adapt the activity. Locate photos of a range of marine creatures and select part of the picture to expose leaving the remainder covered. Then ask students to suggest the identity of the creatures.

MAPPING WHAT YOU KNOW

Students are invited to map out what they know about the ocean and its life using this visual technique.

- Provide students with a black sheet of A3 paper and invite them to map out what they know about oceans and ocean life. If students haven't used this strategy before, provide a model using a different subject. For younger students the teacher may record ideas on a class concept map.

- At a later time/s you may invite students to return to this map and add new things they have discovered. Ask students to use a different colour on each occasion they return to the map and add something. This will show the building of ideas over time.



sample concept map

INTRODUCING PLANET OCEAN

Students read or view some amazing things about oceans.

- Make a copy of *Resource sheet: Planet Ocean facts*, cut into slips, mix up the order and give one slip to each student. Invite students to move around the classroom and locate two other people who have a fact slip related to theirs. (There are 30 fact slips on the resource sheet comprising ten groups of questions with three questions in each group. The slips vary in length and complexity to accommodate the various literacy levels of students.)
- With younger students use pictures of a range of marine creatures instead. For example use three pictures of seven to ten different creatures E.g. sharks, reef fish, coral, starfish, rays, jellyfish, crabs, molluscs (shells), whales, dolphins, seals, deep-sea fish. (If you don't have access to pictures such as these print them from the Brink Expedition website. Go to Schoolroom, Fact files, Marine creatures pictures.) Give a picture to each student and invite them to move around the classroom and find two other people who have an animal like theirs.
- When students have formed their groups of three invite them to read out their fact slips/show their pictures to the class.

ASKING QUESTIONS

Students write their own questions.

- Ask students if they have any questions arising out of the previous activity. This could be done as a class discussion with the teacher recording a class set of questions. Alternatively students could use a think, pair, share strategy. Using this approach, students write their own questions before sharing them with a partner. Then pairs are invited to choose and share one of their questions with the class which is recorded on a

whiteboard or oht so everyone can see them. (When you record the questions write the names or initials of the pair that submitted the question. Don't be concerned about questions that seem similar. Ensure that each pair has a question in the class list.)

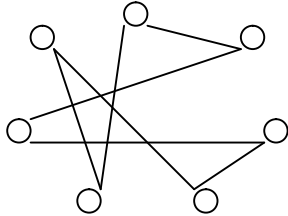
- With the list in full view of the class invite students to consider how the questions might be grouped. (You may need to provide some scaffolding depending on students' experience of asking questions. Questions could be grouped around topics e.g. marine mammals (What do whales eat?), oceanography (What causes ocean currents?); or type of question e.g. questions asking for information (How many seas are there?), questions that can be investigated (How does the sea get salty?) and complex questions that need to be clarified with students and then possibly turned around so they become questions that can be investigated.
- Negotiate with students regarding which questions they would like to investigate. The activities below may assist in those investigations. There are many other materials which have activities to support student investigation of oceans and marine life.

DISCOVERING WHO EATS WHO

Students explore marine food chains and webs.

- Provide opportunities for students, especially younger students, to observe some food and energy relationships. This could take the form of a classroom pond/aquarium study or viewing of a video that shows some food and energy relationships.
- Ask students what food and energy relationships they observed. (As younger students are likely to understand these relationships in terms of a single predator and single prey it is useful to start there and work sideways. E.g. If a student says, "A shark eats a fish" you could ask, "What does the fish eat?" In this way you can build a simple food chain.) Discuss the relationships in terms of energy transfer. E.g. The fish provides energy for the dolphin.
- Introduce students to ways of representing these relationships in chains or webs. Examples of marine food chains and web are found on *Resource sheet: Marine food chain and web*. You may choose to discuss food and energy relationships in rock pool, estuarine or beach environments before looking at food and energy relationships in the open sea as more students are likely to have observed some of these interactions.
- Use the cards in *Resource sheet: Estuarine food web cards 1 or 2*, (or use these as a basis for making another food web) to model the interactions between organisms. Do this by assigning students in your class an organism/element card which they can attach to their shirts with tape or pin. Create or move to an open space and ask students to form a circle. You will need a few balls of wool which you will use to make connections between the 'organisms' standing in the circle. You may wish to invite a couple of students to assist you making the connections. Invite someone to start by asking who they are, who they are connected to and how. Students can read this from their card E.g. "I am a dugong. I am connected to the seagrass because I eat it." When the student makes this statement give them the end of a piece of wool and take the ball of wool to the seagrass. The seagrass organism then reads their card and the wool is passed around the circle, with the help of those two student assistants, until all organisms/elements are connected.

- With younger students, use half the class, rather than the whole class, and simplify the number of organisms/elements in the web. The student onlookers could direct the teacher to make the connections between the organisms/elements using the wool. Later students could swap places and use different cards.



simple web

- Following the class web, provide students with selected cards from *Resource sheet: Ocean energy cards* and ask them to create a diagram showing the connections between them. The number and type of organisms you choose will depend on the ability of the students. This activity can be used to assess students understanding Life and Living 2.3, 3.3 4.3.

DISCOVERING WHERE ANIMALS LIVE

Students examine marine habitats.

- Facilitate a class discussion about the habitats of marine animals to find out what students know. You may want to show a video to provide students with some visual stimulation. (If your school library doesn't have any appropriate videos, try the town library, local video shop or video library. Additionally, there are often nature shows on television that you could tape and show to students.
- For younger students read or paraphrase *Resource sheet: Marine environments 1* using pictures from books to assist you. For older students follow the expert jigsaw instructions below.
 - Make six to eight copies (multiply this number by four to get the number of students in your class) of *Resource sheet: Marine environments 1* and cut into the four sections.
 - Invite students to form groups of four and assign each group member a section of the resource sheet.
 - Next, ask students to meet with the members of other groups who have been assigned the same section, forming a new group. In this new group direct students to read their section and talk it through so that each member has an understanding of the text. Invite groups to ask you any clarifying questions.
 - Students return to their original groups and teach the members about their section of the ocean.
- Provide younger students with copies of *Resource sheet: Marine environments 2* and *3* and invite them to place the marine animals in the appropriate zone. The animals pictured are mentioned in the text. Older students could be invited to create a poster, mural or electronic illustration, individually or cooperatively, showing one or more ocean habitats and its inhabitants.

MAPPING THE OCEAN PLANET

Students are introduced to maps of oceans, ocean topography, depths, currents and temperature.

- The sites listed below contain lesson plans and maps on the above topics for middle primary to middle secondary students. Some of the resources contain detailed student materials. *Resource sheet: World oceans map* can be used for a range of activities from simply labelling world oceans to detailing warm and cold ocean currents.
- <http://www.oar.noaa.gov/k12/html/oceans.html>
- http://oceanexplorer.noaa.gov/explorations/02hawaii/background/education/media/nwhi_lessons.html
- <http://school.discovery.com/lessonplans/programs/oceans/oceans.rtf>
- <http://pao.cnmoc.navy.mil/pao/Educate/OceanTalk2/indexnew.htm>
- http://www.ngdc.noaa.gov/mgg/image/global_topo_large.ocean.gif

INTRODUCING THE GLOBAL 200

Students undertake an Internet research on key marine ecoregions.

- The Global 200 are ecoregions that scientists working with the World Wide Fund for Nature have identified as being crucial to the conservation of global biodiversity. Of the 238 ecoregions 43 are marine ecoregions. For more information go to: www.panda.org/about_wwf/where_we_work/ecoregions/global200/pages/home.htm
- Provide a copy of *Resource sheet: Brinkx marine ecoregion hotspots* for each student and invite them to complete the table using: www.panda.org/about_wwf/where_we_work/ecoregions/global200/pages/list.htm
The first three ecoregions chosen for this table are those the Brink Expedition Team will sail through on their voyage from South America to Europe. The fourth ecoregion is the Great Barrier Reef in Australia. The table deliberately doesn't include looking at threats to these ecoregions as this will be addressed in later activities when students revisit the Global 200 in Part 3 of this module.
- Following the completion of the table, students could be invited to choose one of the other marine ecoregions in the Global 200 and prepare a poster or give a brief oral report to their classmates. In this way all students can get a snap shot of global marine biodiversity. Later when students revisit the four ecoregions listed in the table they could also identify the threats to the ecoregion they researched and compare the threats.

PLAYING AN OCEAN QUIZ

Students select and research a topic of interest and prepare questions for a class quiz.

- Invite students to research a topic of interest and prepare 2-4 questions of increasing difficulty on that topic to use in a class quiz. Younger students can write one question based on a picture and modelled on a limited number of question forms E.g. What does the _____ eat? Where does the _____ live? Make sure students know the answer to their question/s.
- Invite students to form teams and rotate the asking of questions ensuring the quiz is structured so that teams aren't asked their own questions. With younger students, invite each student to ask their question to the whole class or group.

PREPARING A REPORT

Students select and research a topic of interest and write an information report.

- Invite students to choose a topic of interest to research. Use *Resource sheet: Sample graphic organiser* to demonstrate the use of a graphic organiser record research.
- If students have not written an information report before, model how to structure and write an information report.
- Use *Resource sheet: Sample report assessment* with students to assist them with this task.

INVITING CLASSROOM VISITORS

Students invite guest speakers to the school

- Facilitate a conversation with students about people who have knowledge of marine environments. Make a list and ask students if they know anyone with this type of knowledge that they could invite to the classroom to talk to the class. Guest speakers could be family, friends or another member of the community whose occupation or interests bring them into contact with the sea including: recreational or commercial fishermen, tourist operators, scientists, members of local environmental groups, state or local government officers, surfers, scuba divers or navy personnel.

SHARING DATA WITH ANOTHER SCHOOL

Students link up with students at another school and share/exchange their discoveries.

- Invite students to share what they have learnt with other students. Go to the Brink Expedition website at www.brinkx.org then go to Schoolroom, Global pen pal community. Here you and your class can search by year level and country to locate students who have signed up to participate in this project. You'll need to sign up your class before you can access the pen pal community. Do this by clicking on the "How to be a pen pal" text on the right of the screen and follow the steps.

STARTING A REFLECTION LOG

Students begin a reflection log of their thoughts and feelings.

- Invite students to reflect on what they have learnt about the ocean. For students who require structured guidelines to assist them in this task use the *Resource sheet: Sample reflection log* appropriate to your students.