# BETTER WORLD PROGRAMME

# OCEANS

## Introduction:

The Better World – Oceans badge focuses on learning about the threats facing our ocean's health, including pollution, overfishing, climate change and habitat destruction, the impacts of these threats, and finding out what actions you can take to help protect our oceans.

The ocean provides us food and other materials that we need, it regulates our climate and provides half of the oxygen we breathe. The ocean also helps us with transportation and provides opportunities for recreation. People have long thought that the ocean was so wide and bountiful that it would go on supplying our needs forever, but this is not the case: human activities are causing significant damage to life in the ocean. You may be unaware of the problems created by our heavy reliance on the ocean, as we seldom take the opportunity to look beneath the surface of the water and see the damage that our actions are causing. Use the *Background Information* supporting document to help you learn more about these issues, and back up your learning by doing.

To complete this badge you will learn about the ocean and what's causing the damage being done to it, plus consider some solutions to these problems. You will do this by undertaking activities that help you to experience and appreciate our oceans. These will help you identify where action is needed and plan a project that will help to address at least one of these issues. You will then complete your project, either on your own or in a team, and share what you have done with others.

Remember to Plan, Do, and Review as you work through each stage.

**Contents:**



## ALIGNMENT WITH SDGs:

# BETTER WORLD – OCEANS REQUIREMENTS

## OVERVIEW

Complete four activities from Section 1 (Experience).

Complete a project based on one of those activities for Section 2 (Act).

Share your project and what you have learned for Section 3 (Share).

## SECTION 1: EXPERIENCE

- Undertake **one** activity related to **each** of the following, to help you

a) learn about the ocean – what exists beneath the surface, its ecosystems, how the ocean can influence weather and climate, and why the ocean is important
b) understand the threats to our oceans, including pollution, overfishing, and climate change
c) recognise the impacts of these threats on our oceans
d) recognise some solutions to these threats

These activities can be from the Activity Guide (page 4), or create your own.

## SECTION 2: ACT

- Select one of the topics you have learned about that you would like to focus on in detail.
- Find out more about the problem, and research what (if any) solutions people are already working on to remedy it.
- Determine a goal that you would like to achieve around this issue.
- To achieve your goal, create a project you could complete that would help fix the problem you have identified. Use the Project Guide (page 18), or create your own.
- Plan the project. This includes researching, delegating responsibilities, working out a timeframe, working out what equipment is needed, determining what skills and people you need, using experts, and putting all the pieces in place to successfully do the project.
- Do your project. If it's a team activity, make sure everyone's involved and working as a team. Test out new skills, follow your plan, and have fun.

## SECTION 3: SHARE

- Did you achieve your goal? Why/why not?
- Reflect on the impact of your project.
- Reflect on what you have learned. How do you feel about our oceans now? Are you worried about them, excited about how you can make a difference, or not interested?
- Choose a way to share your project and what you have learned with others as a way to spread the word and encourage participation. This should include explaining how human activity can affect the ocean and describing actions they can take to help protect it.

- Identify future actions that could take place in your local or global community and how you could continue to act on what you have learned.

Acknowledgements:

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# OCEANS: ACTIVITY GUIDE

*Note: K, C, S, V, and R refer to Keas, Cubs, Scouts, Venturers, and Rovers, and indicate which sections the activity is most suitable for. These are suggestions only.*

## A) LEARN ABOUT THE OCEAN

*After completing these activities, you will UNDERSTAND what it's like beneath the surface and RECOGNISE the ocean's importance to people and the planet.*

- Undertake a survey of at least 25 people. Try to make sure they represent our diverse society. Find out how much they value the ocean. What do they use it for (swimming, boating, exploring, snorkelling, fishing, food, making money)? Do they think it's important? How often do they see or experience the ocean? Collate your results and present your findings to your group. Do some research to find out how important the ocean is to New Zealand. How big is New Zealand's marine environment? How does that compare to our land size? How much does our ocean contribute to our economy? How many of our exports come from the ocean? Compare the results of this research to your survey. Do you think New Zealanders appreciate the importance of our ocean as much as they should? Why/why not?
  **K, C, S, V, R**
- Discuss life in the ocean. What is the biggest sea creature you can think of? What is the smallest? What lives near the coast and what lives out at sea? Have a look at a range of reference materials and make a list of the animals and plants that live in the sea. Make a drawing, collage, or model of what you think life underwater might look like. Put together an ocean display in a public place.
  Extension: Do you know a marine biologist, or someone who is knowledgeable about the sea? Is there a marine laboratory near you? If so, invite someone to talk to your group about marine life. If not, do some research yourself. Find out about a marine animal or plant that interests you. How big is it? Where does it live? What does it eat and what eats it? How long does it live? Do people use it in some way? Present your findings to your group.
  **K, C, S, V, R**
- Organise a group visit to a beach at low tide. (Before you go, make sure you read the Seashore Code and remember, even if you live next to the coast, don't go without an adult. Make sure you tell someone where you are going and when you expect to be back). Look for animals and plants that live on the shore. Look by the waterline and higher up the beach; check underneath rocks, but be sure to put them back carefully as you found them. Are there any rock pools? What can you see in them? Can you see any holes in the sand? What might be living in them? Draw pictures or take photographs of the animals and plants that you find. Do you know what they are? If yes, label each picture. If not, look it up in a seashore guidebook. If you're still not sure what it is, take notes describing the plant or animal and research it when you get home. Where

did you find each animal? Why are they found there and what special features do they have to be able to survive there? What does the food web look like for these animals? Try drawing it!

Extension: Put together a display of some plants and animals you can find at your local beach to help your friends and whānau identify them. For the more ambitious, you could try putting together a whole guidebook.
**K, C, S, V, R**

- Research some key facts about the ocean closest to where you live. For example, how large and deep is it? What human activities go on there? In what other ways does this ocean influence your life? Put together a quiz for the rest of your group and compare your findings by answering each other's questions.
  **K, C, S, V, R**
- Use virtual reality to explore beneath the surface of the ocean in New Zealand. A good example can be viewed on the northern sites at www.nzgeo.com/vr.
  **K, C, S, V, R**
- Check out a bunch of underwater videos from Young Ocean Explorers - www.youngoceanexplorers.com. Were they what you expected? Which was your favourite? Share it with your group.
  **K, C, S, V, R**
- Did you know that "every second breath comes from the ocean"? What does that even mean? Learn about photosynthesis and how it works under the water to contribute to our oxygen supply. Share your findings with your group.
  **K, C, S, V, R**
- Watch the BBC documentary series *Blue Planet* or *Our Planet*. What did you learn? Did you already know our marine environment was like that? Make a summary of the most surprising or interesting things you learned and share these with your group.
  **K, C, S, V, R**
- Go swimming, snorkelling or diving, ideally in a marine reserve, in New Zealand. Check out the life under the surface. What surprised you most about New Zealand's marine environment? Describe your trip and what you saw to your group.
  **K, C, S, V, R**
- Find out about marine reserves. What are they trying to achieve? Are they effective? How many are there in New Zealand? How much of New Zealand's marine space is protected? Do you think this is high or low, and why? Visit one if you can. Contact Experiencing Marine Reserves (www.emr.org.nz) for more information or support.
  **K, C, S, V, R**
- Clouds in a Bottle experiment. *Materials: a 2-litre clear plastic bottle, matches and warm water.*

1. Pour warm water into a plastic bottle until it is about one third full, then close the lid. This warm water will start evaporating (especially if you place the bottle in the sun). This adds water vapour to the air in the bottle, which is the first ingredient for making clouds.
2. Squeeze the bottle slowly, hard, and then release it slowly. The squeeze represents the atmosphere warming up, and the release represents it

cooling down. If water droplets appear on the sides of the bottle (this is called condensation), shake the bottle to get rid of them.

3. Take the lid off the bottle. Carefully light a match and hold it near the bottle's opening for a few seconds. Light the match, then blow it out so it smokes. Drop the match into the bottle and quickly put the lid back on, trapping any smoke inside. Smoke is made up of many small particles, like dust. These particles are the second ingredient for making clouds.
4. Once again, slowly squeeze the bottle hard, and then release. What happened this time? Did you see a cloud form inside the bottle when you squeezed it, but when you released it, the cloud disappeared?

**K, C**

- Foggy Fog experiment. Carefully fill up a normal glass jar with hot water. Then carefully pour most of the water out again, leaving about 3 cm of water in the bottom of the jar. Place a sieve or strainer on top of the jar and drop three or four ice cubes into it. What happens? The cold air from the ice cubes meets the warm, moist air in the jar – it should make the water condense and form an eerie fog. Did it work?

  **K, C**
- Making Salt experiment. *Materials: A shallow dish with sides (e.g. a baking tray), seawater (or a solution of 1½ teaspoons of salt in 250 ml warm water), a protected outside area or a sunny windowsill, scales.* Pour 1-2 cm of seawater into a dish and leave it in the sun. Slowly, the water will evaporate (disappear into the atmosphere), leaving only the salt behind. Have each member of your group guess how long it will take for the water to disappear. Once the water has gone, the person who guessed closest can taste the crystals left in the tray, to make sure they really are salt. Collect the salt and weigh it. How much water would you need to produce 100g of salt?

Extension: On your own, find out some interesting facts about salt. For example, what is salt? Why is salt important for humans? Why shouldn't we drink salty water? How much salt is in seawater and has seawater always been this salty? When you buy sea-salt from the shops, how has it been extracted from the sea? What do we use salt for? Create a poster of key salt facts. To get you started, visit: www.marinebio.net/marinescience/02ocean/swcomposition.htm

**K, C, S**

- Scope it Out experiment. *Materials: A large plastic tub (e.g. a yoghurt pot), clear plastic food wrap, elastic bands or sticky tape.* To build an underwater scope, cut off the end of the plastic tub so that it becomes a tube. Cover the end with clear plastic food wrap and make sure it is securely attached to the tube using elastic bands or sticky tape. The next time you go to the beach, find a sheltered, shallow and calm part of the sea (a rock pool would be ideal) and have a look at what is going on underwater. Put the end of the tube (the end with the plastic) into the water. The water should push the clear plastic up slightly, making it act as a lens and magnifying what you see. Write down what you see and/or draw pictures.

  **K, C, S**
- Listening In experiment. *Materials: A small microphone that can be attached directly to some earphones, a balloon, a small piece of rubber tubing, non-hardening clay or putty, a cable tie, some water-based*

*lubricant, some small coins.* To listen to underwater sounds, build a hydrophone (an underwater microphone).

1. Put a small microphone inside a balloon (the thicker the balloon, the better). Water-based lubricant (like a soap solution) can help you slip the microphone inside, but be careful not to get it too wet.
   2. Also put some coins in the balloon to make sure that it will sink when you put it in water.
   3. Connect the microphone to the headphones.
   4. Make a plug for the neck of the balloon using a piece of thick rubber tubing. Run the microphone/headphone cord through the tube and fill it with non-hardening clay or putty.
   5. Make sure there is a tight seal around the neck of the balloon using the cable tie.
   6. Go to the beach, sink the balloon and listen through the earphones. What can you hear? Describe your experience to your group.
   **K, C, S**

- Think about all the things people do at the coast, on the beach, in ports and harbours, out at sea, in the water or on the seabed. Next, think about the products or things that the ocean provides: food, medicines, building materials, objects, etc. Make a scrap-book showing all these different uses and products.
  Extension: Many uses of marine products are a bit hidden. Did you know, for example, that you probably put seaweed in your mouth when you brush your teeth? Many toothpastes contain a product called alginate, which comes from seaweed. Find out more about how seaweeds (or other marine plants and animals) are used in manufacturing. What food products or medicines contain seaweed? And how do farmers and gardeners use seaweed? Add this information to your scrap-book.
  **K, C, S**
- In your group, discuss marine food chains. Which animals are predators (eating other animals) and which animals are prey (being eaten by other animals)? Also talk about herbivores (animals that only eat plants), carnivores (animals that only eat other animals) and omnivores (animals that eat both animals and plants). Can you name some marine herbivores, carnivores and omnivores? Where do humans fit in? Use pictures or drawings of marine animals and plants to create a marine food chain mobile. Make a frame with sticks, wire, or an old coat hanger. Start by attaching a top level carnivore like a shark, then use string to attach the next level of the food chain (e.g. carnivorous fish), then herbivores, then plants.
  Extension: Pick one or two marine animals that you find interesting (e.g. whales, sharks, giant squid, kina/sea urchins, seals, turtles, jellyfish...). Does anything eat them? What is their prey? What does their prey eat? What happens to the rest of the food chain when they die? Draw a diagram of their food chain. You might find that their food chain is not a chain at all but a much more complicated food web.
  **K, C, S**
- Humans are part of marine food webs, just like marine plants and animals. Use as many different ocean ingredients you can think of and prepare an ocean treat for your group. Remember that seafood doesn't only include fish and other sea creatures – there are many edible

underwater plants, too. For example, why not make sushi with seaweed and fish? Learn how your ingredients grew or developed, and how they were harvested. When you go shopping, try to make sure that as many ingredients as possible are locally and/or sustainably sourced. How difficult does that prove to be?

Extension: Why not invite your friends and whānau to a whole ocean banquet? Tell your guests everything you know about what they are eating and convince them of the importance of enjoying sustainably sourced ocean delicacies.

**K, C, S, V, R**

- Read up on hurricanes (also known as cyclones and typhoons). Split into groups and put together a multiple choice quiz about them to test the knowledge of the other groups. Before announcing the winner, let everybody know the correct answers.
  Extension: Research a past hurricane, cyclone or typhoon and write a newspaper article about it. When did it occur and how strong were the winds? What preparations were made by the communities it affected? What damage did it cause to the coastline? Could anything have been done to prevent the damage? If you live in an area where hurricanes occur, do you know what to do when they happen? Create an action plan to help keep yourself and your whānau safe.
  **S, V, R**
- Put together a radio broadcast or video about tsunamis with tips on surviving them. One person could be the interviewer and another could pretend to be a tsunami expert being interviewed. If you know someone who has lived through a tsunami, ask them if they would be happy to share their experiences with you. If not, get another member of your group to pretend what it was like to see a tsunami. What environmental impacts did they witness? You might want to write a script before you start recording. Either record your broadcast, film it, or act out your script in front of the rest of your group. If you live near the coast, find out whether you are at risk from tsunamis. If you are, learn to spot the warning signs and create an action plan for staying safe. Share this with your whānau and friends.
  **S, V, R**
- Choose a marine ecosystem that interests you (e.g. the deep sea, the open ocean, coral reefs, mangroves, salt marshes, rocky shores) and decide what you would like to find out about it. How do you think scientists would go about answering your research questions? Imagine you have the opportunity to carry out some fieldwork to collect data about this ecosystem. How would you choose to go about it? For example, would you use satellite data? Would you need to do a survey by boat? Could you take samples from the shore? Write a research plan.
  Extension: Is there a marine laboratory near where you live, or are there commercial businesses that undertake marine research and expeditions in your area (e.g. hydrographic surveyors, businesses that explore the marine environment looking for oil, gas, and minerals)? Visit the organisation, or invite an expert to give a talk to your group about studying and working in the marine environment.
  **S, V, R**

- Do any other activity approved by your Youth Leadership Team or Kaiārahi.
  **K, C, S, V, R**

# B) UNDERSTAND THE THREATS TO OUR OCEANS

*These activities will help you UNDERSTAND the threats to our oceans and RECOGNISE what human actions can negatively affect the ocean and ocean life.*

- In small groups, find out as much as you can about a piece of coast that interests you. Use books, pictures, photographs, the internet, and ask people you know. If possible, visit the selected beach/coast, take photographs and measurements and make notes. Using your research, draw a map of the area showing where the different physical features are (e.g. areas of land, rocks, rock pools, cliffs, mud), the coastal vegetation (e.g. salt marsh, mangroves, scrub) and human developments (e.g. houses, shops, other buildings, roads, and car parks). Include some information about what you would expect to find nearby offshore (e.g. is there a reef there?). What marine life do you think you will find in the different parts of the beach and just offshore? Are there signs of environmental degradation or pollution? If so, what do you think might be causing this? Think about the different ways that people are using the piece of coast you have just mapped – how might these activities affect the habitats you have described? Ask yourself "What used to be in the places where the buildings are now?" If you don't know, ask someone who lives nearby. Annotate your map with some answers to these questions. Share your finished map with the whole group.
  **C, S, V, R**
- In small groups, research a marine habitat other than your local beach. Locate your group's habitat on a world map, learn how marine life is adapted to living there, and list what human activities go on there. Find out if the habitat is endangered by environmental change or human activities. If so, what can be done to help? Take turns with the other groups to present what you have learned. How are the chosen habitats similar and how are they different?
  **S, V, R**
- Ice Caps experiment. *Materials: A large tray or pan (at least 10 cm deep), a rock or brick (to represent an island), a waterproof marker pen, ice cubes, water.* 1. Place an 'island' (the rock or brick) in a large tray or pan (why not decorate it with trees, houses and people?). Pour cold water into the pan until the bottom of the island is covered. Add some ice cubes to the pan (you will need quite a few), representing the sea ice found in the Arctic and Antarctic. Mark the level of the water on the side of the 'island' before the ice has melted. Leave the pan until all the ice has gone. Mark the water level on the island again. What has changed?

2. Now set up your island as before, but instead of placing the ice in the water, put the ice on your island. This ice represents the ice in glaciers and on mountain tops. Make sure you mark the water level before the ice has melted. Once all the ice has gone, what has changed? How do the findings from part 2 of the experiment differ from the findings in part 1? Why do you think that is? What does this mean for global sea level rise?
   **K, C, S**

- Organise a visit to your local fish market (if there is no fish market close by, you could visit a fishmonger or the fish counter at your local supermarket). How many different types of fish and shellfish can you see? Where have they come from? Are they deep sea fish or have they been caught near the coast? Who caught them? Were they local fishers or fishers from far away? How were they caught? Have any of the fish come from a fish farm? Draw pictures or take photos of the different seafood you see and make a big display. Add notes to the images about the facts you discover.

*Extension:* Has our use of seafood changed over the years? Gather recipes from grandparents, parents and recent cookbooks to see if the types of seafood we eat and the ways we prepare them have changed. Try making some of the recipes.

**K, C, S, V, R**

- Overfishing is one of the greatest threats facing our oceans. Organise a debate about the sustainability of fishing and the use of different fishing gear and practices. Each person in the group researches the pros and cons of a different type of fishing, and the quota system. You may also want to find out about the differences between recreational and commercial fishing. Each person should make a short presentation about why their form of fishing is best. Once you have finished your presentations, invite the audience to ask questions. When all the questions have been discussed, ask the audience to vote on which form of fishing they think is most sustainable. Discuss the vote result.

  **S, V, R**
- Find a video of deep-sea trawling or dredging. What do you think about this fishing practice? What might some of the impacts be? Research why deep-sea trawling or dredging exists. Are there any countries which don't use these methods? Are there any alternative methods?

  **C, S, V**
- Healthy, renewable food from fisheries will become more important as agriculture suffers from drought and other impacts of climate change (Source: Marine Stewardship Council). But many fish species are being caught faster than they can reproduce, putting them in danger of disappearing altogether. We can help by only buying and consuming fish and seafood that are not in danger of going extinct, or that are being farmed using sustainable practices. Find out which species these are and create a brochure with pictures and descriptions of these fish. Advise your readers to opt for them, as opposed to endangered fish, when planning dinner. Distribute the brochures in your local community.

  **S, V, R**
- Try to find out about how fishing has changed over the years. Research facts and figures on your own, but, if possible, interview a fisher (or several) and ask them questions. How long have they been fishing for? Have they noticed any changes (e.g. fish size, type of fish caught, time and place required to capture the fish, fishing regulations, etc.)? How does this compare to what older fishers have told them about fishing in the past? Why do they think these changes have occurred? Are they worried about the future of fishing? Do they expect their children to become fishers too, and if not, why not? Write up your findings in the style of a newspaper article or blog post.

*Extension:* Fisheries management is extremely complicated. It aims to avoid overfishing, but also needs to consider issues like equity and fairness. Find out what fishers have to do to sell their catch: how do they get their fish to market? Do they sell their fish themselves, or does someone else sell it on their behalf? Do they have any experience with certification schemes and ecolabelling? Do they work together to promote their interests (e.g. in a cooperative)? Also explore some wider issues, such as: do men and women play different roles in fisheries? Are there conflicting interests fishers may have with other users of the sea)? Do fishers think current fisheries management is effective – and if not, why not? What are local or national authorities doing, and what do fishers think they should do better? You could even compare the New Zealand fisheries situation you have just learned about with some research on fishers' experiences in other parts of the world. Write a newspaper article or blog post from the perspective of the fishers you have talked to. Why not try to get your article published? Ask your local newspaper, or if you know about making websites, upload it to the internet.
**S, V, R**

- An environmental problem often associated with marine transport is that of invasive species, which become established in new areas and threaten the species already living there. Find out if there are any invasive marine species in your area, and research them. If there are no invasive species, find out about an invasive marine species of your choice. Create a short comic book using all the information you have learned to tell the story from the point of view of the native species. Where have the 'aliens' come from? When did they first appear? What problems are they causing and what, if anything, is being done to control them? Is there hope for the native species? Share your comic with the group.
  **K, C, S, V, R**
- Acid experiment. Learn about ocean acidification, and complete this experiment to see how it works. *Materials: Three small jars, water, vinegar or fruit juice, carbonated water, seashells (or egg shells, pieces of dead coral, or sea urchin skeleton), kitchen scales, pH indicator strips (which can be bought in many pet shops or garden centres).*
  1. In small groups, take the three jars and pour some tap water into one, some vinegar or fruit juice into the second, and some carbonated water in the third. What do you think the pH of each liquid is? Measure it using your pH strips and note it down.
  2. Examine the seashells (or alternative items) and write down their size and weight. Add a shell (or similar) to each jar and make sure it is completely covered by the liquid. What do you think will happen?
  3. Check each jar every hour and record your observations. What is happening to the shell in each liquid? Then check your shells every day for a week and record what you see.
  4. After a week, remove your shell from the liquid, allow it to dry and weigh it again. What has happened? Can you explain it?
  Extension: Design some publicity information to raise awareness about ocean acidification (e.g. a cartoon strip, a poster, a newspaper article, a short radio programme, or video clip). Circulate the information as widely as possible.
  **C, S, V, R**

- Have there been any major marine pollution incidents in your area (e.g. an industrial accident or illegal waste-dumping)? The *Rena* oil spill in New Zealand in 2011 is a good example. Research what happened. What were the effects on ocean plants and animals? What is being done to help reverse these effects? Create a time-line illustrating the sequence of events and their knock-on effects. Which incidents were dealt with most successfully? Which are still a problem? Share your findings with your group.
  **K, C, S, V, R**
- Make a list of all the ways that human activities impact climate change and, consequently, ocean life. What can be done to reduce these impacts? How can you, your whānau, friends, and community support a reduction? Track your own carbon emissions and find ways to reduce them (use the Climate Change programme activity guide to help you).
  **K, C, S, V, R**
- Visit a local farm. Talk to the farmer about what things farmers need to be aware of, or to do, to prevent their farm having an impact on the ocean. Is the farm near the ocean or a significant waterway? What steps has the farmer taken to minimise the farm's impact on downstream ecosystems (such as plantings or fencing)?
  **K, C, S, V, R**
- Visit your local beach or coastline and collect as much rubbish as you can find. What did you find? Sort the rubbish into different types, such as plastic bottles, plastic bags, glass, cans, rope, and so on. Count the number of pieces of rubbish you have of each type and then weigh them. What do you have the most of? And what weighs the most? Take examples of each different rubbish type, and make a display (make sure you clean the trash first) in your meeting place. Include labels to explain how many pieces of rubbish you found and the weight of it. Invite your friends and parents to see the results of your work. See if you can find any companies and organisations with clever ideas for turning marine rubbish into something useful. Help everyone to understand what is polluting our water, and how it gets there. Challenge them to think about what they can do themselves that will make a difference, like using less plastic, being careful about what they flush down the toilet or drain, not dropping litter, doing beach clean-ups and litter collections with other local organisations.
  *Extension:* Research how long different items of rubbish stay in the marine environment. Some things break down quite quickly, while others take much longer. Find out about the danger that rubbish poses to marine life. Add this information to your display. Try to get the media involved. Invite a local journalist or radio presenter to join your beach clean. If they decline, write a report after the event for the local newspaper. Include photos which highlight the amount of trash collected.
  **K, C, S, V, R**
- Survey your friends and whānau to find out what goes down the drain at their house/school. Does any waste/rubbish get flushed down the sink/toilet? Where do they wash their car? What chemicals do they use in their garden? Prepare a report of your findings.
  **K, C, S, V, R**

- Find out all you can about aquaculture and the types of aquaculture that take place in New Zealand. Invite someone who works in aquaculture to speak to your group about their experiences to help with your research. Prepare a presentation explaining what aquaculture is and why we need it, as well as its benefits and disadvantages.
  *Extension:* Many new approaches to reduce aquaculture's environmental impact are being developed, such as mixed aquaculture that produces seaweeds, bivalves, and fish all together. Mention these new approaches as part of your presentation. Why do you think they haven't been taken up more quickly by the industry? How could environmentally sound practices be encouraged?
  **S, V, R**
- Do any other activity approved by your Youth Leadership Team or Kaiārahi.
  **K, C, S, V, R**

# C) RECOGNISE THE IMPACTS OF THESE THREATS ON OUR OCEANS

*These activities will help you IDENTIFY how the ocean is impacted by human activities and CONSIDER the long-term effects of this damage.*

- Some marine species are endangered and under threat of extinction. Prepare a poster with details of ten endangered marine species, giving a few facts about each species, including how many are left in the wild and why they are endangered.
  **K, C, S**
- Find out if tourism and recreation are having negative effects on the marine environment in your area. What can be done to help? Is anything being done to help already? As a group, put together an action plan to make sure tourism and recreation don't become a problem at your local beach, or at your favourite seaside destination.
  **S, V, R**
- Research the habitat of kina/sea urchin - what do they need to survive? Check out a virtual reality video of a kina barren, and compare it to a marine reserve. Some examples are available here: https://www.nzgeo.com/lessons-fishing/. Learn about the predators of kina and how overfishing is affecting the marine food chain and ecosystem.
  **K, C, S, V, R**
- Talk to your local council about whether your local beach is safe to swim at all year round. Find out how your waste water is managed, what causes the ocean to become unswimmable, and discuss what this means for your local community. How is the water tested? At what point does it become unsafe for humans?
  **K, C, S**
- Murky Mussels experiment. Buy some fresh green-lipped mussels from your local supermarket, and collect 5 litres of murky sea water from a local beach (the murkier the better). Get two clear containers with wide necks, like preserving jars. Fill the two containers with equal amounts of cloudy sea water. Place one green-lipped mussel into one of the containers. This will be the test sample. Leave the other container as the control. Time the experiment and observe the mussel in action as it filters the seawater. Stop the experiment when the seawater becomes clear (this should take place over the course of one day). Take photos throughout the experiment or film a time lapse movie. Research filter feeders – how do mussels do it? What other benefits do mussels bring? The mussel population in New Zealand's marine spaces has been severely impacted by unsustainable fishing practices which damage their ecosystem. Present to your group a talk about the effects a reduced mussel population has on our ocean.
  **C, S, V**
- Many people who live in, or near, the Arctic rely on its natural resources. Find out how climate change and melting sea ice is changing the way that they live, and how the change is impacting the whole world. How is New Zealand being impacted by changes in the Arctic's environment?
  **S, V, R**

- Marine ecosystems can help protect coastal regions from the damage of storms. What would happen to these regions if the marine ecosystems are already unhealthy? What would happen if they were destroyed? Create a poster, comic, or play (or other suitable medium) to teach people about the value of these marine ecosystems.
  **S, V, R**
- Ocean Peek Boxes. It is time to create some amazing ocean "peek boxes". Ask all the participants to bring in a box to reuse (cereal, shoe box or whatever box they have that can be recycled). Prepare all sorts of cool crafting materials to create an underwater sea image – stickers, tissue paper, markers, magazine cut-outs, etc. Once everyone has finished their box, with the help of your Kaiārahi, secretly cover everyone's image with black paper or cardboard. Now, ask all participants to peek inside each other's boxes. How did they feel when they saw "nothing"? How is this similar to what is happening with marine ecosystems and animals being affected by climate change - i.e. disappearing? Discuss this with your group. Take away the black paper/cardboard and look at everyone's boxes properly. What can you do to avoid losing our precious marine resources and animals to ensure our environment remains colourful and thriving like your boxes?
  **K, C**
- Coral Reef construction. *Materials: Materials to build a model reef (e.g. white and coloured paper, cardboard tubes, coloured plastics, pieces of wood, etc.).* Corals are fascinating creatures. You might think coral is made of stone, but it is actually made up of colonies of coral 'polyps': tiny, individual animals, with a jelly-like body and tentacles. Coral polyps build themselves hard outside structures (like skeletons) to protect and support their soft bodies. These hard structures help form coral reefs. Corals are different colours because small algae (called zooxanthellae) live inside their structures. These small algae use photosynthesis to produce food which is released to the coral polyp in exchange for the protection that they provide. When the seawater gets too warm, the algae start producing toxins which harm both themselves and the coral polyps. The polyps then reject the algae, even though they need them to survive. Without the algae, the corals look white. The white (or bleached) corals become more vulnerable to disease. Many corals do not recover from bleaching and die. In small groups, using the materials you have collected, build a model of a coral reef. Make part of it a healthy reef and the other part a bleached reef. Include labels to explain what has happened to the bleached reef. Extension: What do changing sea temperatures mean for other marine species and the food webs they support? Find out and make a presentation to the rest of your group.
  **S, V, R**
- Learn about the impacts of marine sports and recreation on the ocean, in particular those relating to boats. How does the way you clean your boat affect the marine environment? How can this be done more sustainably? What other things should you be aware of when enjoying the ocean – e.g. is some sunscreen better or more 'water safe' than others?
  **K, C, S, V**
- Get a feather and study it closely. Fill a shallow container with water. Put the feather in the water and observe how the feather interacts with the

water – the water should be repelled from the feather and not penetrate the feather, and the feather should float on the water. Next, take the feather out and pour some vegetable oil into the container with water. How does the oil and water interact? Do they mix? Which one floats on top? Why do they stay separate? Put the feather into the oil and water mixture. What happens to the feather? Describe what you see happening to the feather. Next, get a fresh pan of water and put the oily feather in. What happens to the feather? How does the oily feather compare with the clean feather earlier in the experiment? Does the oily feather float? Try to clean the feather with only clean water. Are you successful? Now use some mild dishwashing detergent and try to clean the feather without hurting or damaging the feather. In the event of an actual oil spill, wildlife rescue personnel use mild cleansers like this to clean the birds and wildlife. Mild detergents are used rather than harsh chemicals to prevent further harm to the animals. Finish the activity by having a discussion about the effects of oil spills on wildlife.
**K, C, S**

- Research the floating 'plastic islands', such as the Great Pacific Garbage Patch. How did it get there? How big is it? Who is contributing? Other than looking ugly, how does this affect the ocean? Find out more about plastic and other waste in our ocean and how this might affect ocean health. How does this affect humans? For example, do humans eat fish who have consumed plastic particles? Does this mean humans are eating plastic? What are some things that could be done to reduce the amount of plastic and waste ending up in our ocean?
  **K, C, S**
- Biodegradable experiment. *Materials: Spades or trowels; 100 x 100 mm pieces of each of the following: Plastic foam (from a plate or a meat tray), 'Biodegradable' plastic shopping bag, Plastic shopping bag, Cardboard, Thin woven cotton fabric, Piece of lettuce/cabbage leaf, Aluminium foil; Coloured marker pegs; Sheets of acetate with a fine grid (5 mm squares) copied onto it; Whiteboard pens.* Decide where you will be able to dig small holes in soil and leave them undisturbed for 2 weeks. Dig a 300 x 300 mm square hole about 100 mm deep. Place the material samples in the hole so that they are not resting on top of each other. Cover the samples with soil. Place a marker over the samples so that you can find them when it is time to dig them up in 2 weeks' time. After 14 days, return to the site and carefully dig up the samples. Carefully place the samples on a tray or in a box lid to carry them inside. Take care, as some samples may tend to fall apart. Place the 100 x 100 mm clear plastic acetate grid over each sample. Use a whiteboard pen to mark each square on the grid where the material is changing or breaking down. Count the squares marked and record the number for each material in a table. Based on what you have learned, have a discussion about what items are most likely to biodegrade over time, and which aren't. What does this mean for our ocean? What can we do to make a difference?
  **K, C, S**
- Do any other activity approved by your Youth Leadership Team or Kaiārahi.
  **K, C, S, V, R**

# D) RECOGNISE SOME SOLUTIONS TO THESE THREATS

*After completing these activities you will be able to IDENTIFY ways to reduce the human impact on the ocean and TAKE ACTION to protect it.*

- Create a list of everyday activities that you can easily change to help reduce your carbon emissions. (Refer to the Climate Change programme to help you out). Choose three ways to reduce your emissions and commit to making these changes for at least a month. Revisit the challenge after two weeks to monitor how you are getting on. Are some activities easier to change than others? Does your challenge need to be modified in any way? Renew your pledge and commit to keep going!
  **K, C, S, V, R**
- Learn about Marine Protected Areas (MPAs)/Marine Reserves and discuss their advantages and disadvantages for people and marine life. How many marine reserves are there in New Zealand? How much of our marine environment is protected? How does this compare to our protected land area? Where is your closest marine reserve? When was it established? How large is it? Find out why marine reserves are important and what some of the challenges around increasing their number/size are. Report your findings back to your group.
  **C, S, V, R**
- Some species are important for cleaning the water in a marine ecosystem. These filtering systems can remove bacteria, viruses, heavy metals, toxins and/or debris. Research and compare the methods used by different species, such as oysters, mosses, and trees, to filter water. Make your own water filter using natural or recycled materials.
  **S, V, R**
- The MPA Debate. Stage a role-play or debate, to decide whether your local beach and surrounding area (or another place on the coast you have visited) should be made into a Marine Protected Area (MPA). Think about all the different people who might be affected by an MPA, including the people who currently use the area (e.g. tourists, fishers), the businesses that support them (e.g. local hotels, developers, leisure providers, fishing shops or markets), those who will enforce the MPA (e.g. local authorities), those who are campaigning for the MPA (e.g. conservation organisations) and the general public. Note, there only need to be a couple of people who disagree with the area becoming a MPA. Designate a role to everyone in your group (but keep one person as a chairperson). Each individual considers the reasons why the Marine Protected Area is a good or bad idea, and how it might benefit or disadvantage them. Debate with or against the opinions of other users – try to find compromises to align your interests. Invite an audience to listen to your debate. The chair gives everyone a few minutes to speak, after which the audience gets to ask questions, too. The chair makes sure everyone has a fair chance, and that nobody speaks for too long. They should also summarise the key issues at the end of the debate, after which the audience is asked to vote. Should there be an MPA or not? How should it be designed, implemented, and managed?
  **S, V, R**

- Visit a local waterway and see if there is any planting near (or in) the water. These plants act as a buffer to help prevent our oceans being polluted. Research the benefits of waterway plantings. What plants (if any) are there? Are they planted or do they occur naturally? Are they at risk of being damaged/torn down? What species of plants act as natural filtrators in your region?
  **K, C, S**
- Imagine you are going out for a day's fishing with four relatives. Download the free NZ Fishing Rules app to find out: a) how much snapper you are allowed to catch? b) what is the smallest snapper you are allowed to catch? c) what should you do if you catch a snapper that is too small? Do you think you need to catch your full limit? Would it be better if you only caught what you needed? Discuss with your group how much is 'too much'.
  **C, S, V**
- Many common fish species that we see at fishmongers or in supermarkets are in danger. Either they are being overfished or the way they are caught or farmed is damaging the marine environment and other marine species. Discuss what you know about fishing, and do some research to find out more. Which types of seafood are most sustainable? What recipes can you find for cooking with them? Go to the supermarket and look at the different seafood options available. Decide which option is the most sustainable to purchase – refer to the *Best Fish Guide* and Marine Stewardship Council (MSC) certification to help you make your choice. Try to find out where certification has been used and what has happened since to fisheries and the environment in areas producing ecolabel seafood. Why not create your own ecolabel? Think about the sustainability issue you want to address, and how you could do this. Get an adult to download the *Best Fish Guide* app and determine which sustainably sourced seafood to buy in supermarkets, fish & chip shops, and restaurants. Ask questions about the fish you are buying "*What species is it? Where was it caught? How was it caught?"*. Write a letter or an email to your local fish & chip shops/restaurants to ask these questions as well. You could even try to encourage your local restaurants, cafes and shops to buy from suppliers that only sell sustainably caught or farmed seafood.
  **K, C, S, V, R**
- Host a shared dinner and challenge guests to bring a dish using seafood on the green 'good to eat' list from the *Best Fish Guide*.
  **K, C, S, V, R**
- Do any other activity approved by your Youth Leadership Team or Kaiārahi.
  **K, C, S, V, R**

# OCEANS: PROJECTS GUIDE

*These projects will enable you to ORGANISE and participate in a community initiative to help protect the ocean, and CONVINCE other people to join in your efforts.*

Note: It is vital to ensure that your project is going to achieve its intended outcome of benefiting others through a focus on community development. Being helpful, rather than just assuming helping through your service project. Use a partnership focus – find out what is needed and helpful to the community you are intending to support, and find out what is already happening that you could get involved with, before creating your project. To make significant change, partnerships and empowerment are key.

- Create a short film, photo-story, play, or podcast explaining how humans affect the ocean and coastline near you, and how this in turn affects the local community. Decide on your message: what do you want to tell people about? What do people use the area for? What is special about this location? What animals and plants live there and how might they be affected by tourism, trade, industry or any other human activity? What can be done to protect the area? How can people help? Is there someone interesting you can interview about the beach? Is the area threatened by rising sea levels or coastal erosion? Is the area being properly looked after or is there litter and pollution? How is marine life being impacted? What can be done to protect the area? Decide how long you want your film to be. Write a script before filming and get some feedback on it. Once you have completed the filming, hold a screening in your community. You could also upload your film to the internet or submit it to a film competition. If you wrote a play, perform it for your friends, whānau, and community – you could even invite local politicians and business representatives. Try to get your podcast broadcast on local radio, or upload it to the internet.
  **K, C, S, V, R**
- Discuss the problems at your local beach or in your local coastal area that you would like to change with your group. Or is there a national or international issue that you think people in your area should be aware of (e.g. overfishing, pollution, coastal development, or climate change)? Start an awareness-raising campaign. Think about things like: who is your audience? How will you reach it? How long should your campaign last? What outcomes would you like to achieve? There are many ways that you can reach your audience. You could start by writing a letter to people in your community to persuade them to change their behaviour. You could make posters informing people of the problem and put them in conspicuous places around your community. You could hold an event, giving presentations and handing out leaflets explaining the issue. You could try to get the local media involved. You could make your own film or radio programme (ask some professionals for help). What other ways can you think of?
  **K, C, S, V, R**

- Create a sustainable product that replaces single-use plastic (e.g. reusable bags, paper straws, bamboo toothbrushes). If you and your group can make enough of them, you could ask your local shop to start using them, or give them away outside your local shop or shopping centre, explaining to shoppers what you are doing and why. Give them away or sell them as a fundraiser to friends, whānau, and your local community.
  **K, C, S, V, R**
- Create a campaign to teach people how to avoid overusing plastic, for example; reusable bottles, using keep-cups, buying unpackaged fruit and vegetables.
  **K, C, S, V, R**
- Every 8th of June is World Oceans Day, a day dedicated to celebrating the beauty and importance of the ocean. Organise a day of celebration for your Scout Group or in your community. Design a logo for a t-shirt to mark the day, organize a treasure hunt, hold a sand sculpture competition, or have a beach party. Display the materials you have produced from other activities for this badge. How can you generate the most publicity for World Ocean Day?
  **K, C, S, V, R**

Extension: World Oceans Day has been officially recognized by the UN since 2009. Why not organise your own model United Nations? Talk about international issues that affect our oceans, and the kind of solutions being implemented in New Zealand and abroad.
**S, V, R**

- Volunteer on a regular, on-going basis for an ocean-related organisation that interests you. This could be a coastal conservation organisation, an ocean research institute, your local aquarium, an aquaculture farm or any other group that seems worthwhile to you. How about keeping a blog (or diary) about your experience? Then you can tell your friends, whānau, and the wider community about your contribution to ocean conservation or sustainable ocean use – share what you are learning with others.
  **C, S, V, R**
- Organise a planting day for your group, or a group of volunteers. Make sure the planting takes place near a waterway to help protect the ocean.
  **C, S, V, R**
- Organise a trip for your group to your closest marine reserve. Try to take your group swimming or snorkelling to experience the marine life beneath the surface.
  **K, C, S, V, R**
- Write letters or create a campaign advocating for more marine reserves.
  **S, V, R**
- Create a campaign around drain awareness – build mesh nets to go over drains, or murals around drains that say 'Drains are only for rain'. Advise people what can/can't go down the drain, where the best place to wash their cars is, and how to prevent chemicals getting to our ocean.
  **K, C, S, V, R**
- Learn about seabins. If there is one in your local area, go and have a look at it and seek permission to audit the waste it collects. Fundraise for, and set up, a seabin in your area.
  **C, S, V, R**

- Organise a beach clean up for your group. Consider ‘adopting’ a stretch of beach or coastline to keep constantly tidy.
  **K, C, S, V, R**
- Do any other project approved by your Youth Leadership Team or Kaiārahi.
  **K, C, S, V, R**