

**KEEP THE
OCEANS
CLEAN!!**

**A project for schools across
New Zealand in conjunction
with the Auckland Stopover of
the 2011/12 Volvo Ocean Race**

**VOLVO
OCEAN
RACE**

2011 - 2012

AUCKLAND - NEW ZEALAND

Stelton Sea

OVERVIEW

- ▶ Introducing the Volvo Ocean Race 4
- ▶ *Keep the Oceans Clean!* initiative 4
- ▶ Auckland Stopover Schools Programme 5
- ▶ Free guided visits to the Auckland Stopover Race Village 5
- ▶ National Competition for schools 5

THE AUCKLAND STOPOVER KEEP THE OCEANS CLEAN! SCHOOLS PROGRAMME

- ▶ Links with the NZ Curriculum 7
- ▶ Identifying the issues 8
- ▶ Identifying impact on marine life such as the Albatross 8
- ▶ Investigating the impact of rubbish on our school/community 9
- ▶ How art can communicate the issue of pollution in our ocean 12
- ▶ Discover the Volvo Ocean Race 14
- ▶ The Skeleton Art Competition 15
- ▶ Creating Skeleton Art 17
- ▶ Factivities 18

BACKGROUND INFORMATION

- ▶ The Volvo Ocean Race 22
- ▶ What is a gyre? 23
- ▶ Learn about plastic 24
- ▶ Save the albatross 25
- ▶ Who's taking action? 26
- ▶ Resources 27
 - Links 27
 - Books 28
 - Music 28
 - References 28

Credits

The Auckland Stopover Schools Programme is based on the Volvo Ocean Race *Keep The Oceans Clean!* initiative and was devised by the Education Department of the Voyager New Zealand Maritime Museum and the staff of the Auckland Stopover. Photography: Volvo Ocean Race, Skeleton Sea, iStockphoto. Design: engagedesign.co.nz



Charitable Partner of
the Auckland Stopover,
Volvo Ocean Race
2011-2012



OVERVIEW

INTRODUCING THE VOLVO OCEAN RACE

The Volvo Ocean Race is acknowledged as the greatest test of sailing prowess and human endeavour as the world's fastest monohulls race a nine month marathon around the globe deep into the bleak latitudes of the Southern Ocean and through the world's most hostile seas.

New Zealand is renowned worldwide for its maritime achievements. At one time or another, our nation has held every significant blue water sailing trophy in the world. There are six entries in the 2011/12 Volvo Ocean Race, including the Emirates Team New Zealand boat CAMPER.

For the first time in a decade, Auckland will once again welcome the Volvo Open 70's fleet home as an official Stopover for the Volvo Ocean Race. In March 2012 Auckland will stage the Leg 4 finish from Sanya in China and the start of Leg 5, which takes the fleet into the Southern Ocean once again, round the infamous Cape Horn and up to a finish and Stopover in Itajai, Brazil.

The boats are due to arrive in Auckland on Thursday 8 March. The Pro-Am Race is scheduled for the Friday 16 March with the In-Port Race on Saturday 17 March. The Start of Leg 5 will take place on Sunday 18 March.

Auckland Viaduct will be transformed into a vibrant Race Village for the Stopover with the new Viaduct Events Centre acting as Race HQ and a packed programme of entertainment on Latitude Island. 200,000+ visitors are expected and there will be huge media coverage in New Zealand and worldwide.

Read more at www.volvooceanrace.com

KEEP THE OCEANS CLEAN! INITIATIVE

The Volvo Ocean Race has created an ocean conservation project *Keep the Oceans Clean!* to communicate an ocean conservation message around the globe throughout the Race. The 2011/12 Volvo Ocean Race wishes to raise awareness of the grave issue of pollution in our oceans and to empower people to take action!

The project includes a travelling exhibition with movies and sculptures and involves the three founding artists of Skeleton Seas: Xandi Kreuzeder (Germany), Luis de Dios (Spain) and Joao Parrinha (Portugal).

These three surfers and artists started to work together in a green art project in 2005 to communicate the importance of keeping the world's oceans clean. The trio are now travelling the world with the Volvo Ocean Race to create Skeleton Sea Art using materials from beach clean ups and setting up environmental awareness projects at each Stopover.

During the Auckland Stopover, the three will run a community beach clean-up. Then they will run a series of workshops to use the waste collected to create a sculpture to add to the travelling exhibition.



THE AUCKLAND STOPOVER SCHOOLS PROGRAMME

The Auckland Stopover has worked with the Education Department of the Voyager New Zealand Maritime Museum (a Ministry of Education LEOTC provider) to devise a FREE programme for schools, linked with the New Zealand Curriculum. This includes a FREE e-book of resources and FREE guided visits to the Auckland Stopover Race Village.

The *Keep The Oceans Clean!* Schools Programme gives students and their school communities real opportunities through the authentic context of the Volvo Ocean Race to:

- ▶ discover their own coastline/waterways and the activities that take place on and in them
- ▶ identify issues affecting their environment
- ▶ take action for a sustainable future
- ▶ discover that art can bring communities together

FREE GUIDED VISITS TO THE AUCKLAND STOPOVER RACE VILLAGE

In partnership with Voyager National Maritime Museum, the Auckland Stopover is offering schools FREE booked guided visits (terms & conditions apply) to the Race Village at Auckland's Viaduct Harbour on the following dates:

- ▶ Monday 12 March
- ▶ Tuesday 13 March
- ▶ Wednesday 14 March
- ▶ Thursday 15 March

For further details of the guided visits or to book your visit, email schoolsprogramme@mayoand.com

NATIONAL COMPETITION FOR SCHOOLS

A national competition has been set up to encourage schools to take action and communicate the message to family, friends and communities both in New Zealand and all over the globe to *Keep The Oceans Clean!* Full details at www.volvoceanraceauckland.com



THE AUCKLAND STOPOVER KEEP THE OCEANS CLEAN! SCHOOLS PROGRAMME

In this unique integrated unit of learning, students will view and reflect on the issue of rubbish and pollution of the world's oceans and create an artwork made from waste collected from the ocean or waterways.

These activities may be used as part of an inquiry into waste or conservation of ecosystems.

Ideas for activities, links to templates, fact sheets and an extensive resource list are provided.

KEEP THE
OCEANS
CLEAN!!

VOLVO
OCEAN
RACE
2011 - 2012



LINKS TO THE NEW ZEALAND CURRICULUM

Contexts:	conservation, endangered species, waste, consumerism, resource use, recycling, reusing
Concepts:	sustainability, interdependence, responsibility for action
Learning Areas:	The Arts, Social Studies, Science, English, Mathematics and Statistics
Levels:	Years 3-4 (this unit can be adapted to different year levels)
Timeframe:	1 Term

Key Ideas/Big Ideas

- ▶ We are a part of ecosystems and our actions and attitudes impact on them
- ▶ Clean oceans are vital to healthy ecosystems
- ▶ Art can communicate with and make people think about social/environmental issues, needs, and values
- ▶ People make art using a variety of materials and imagination
- ▶ Art can create community and belonging

Learning Outcomes

Students will:

- ▶ explore and experiment with transforming waste materials using sculptural ideas
- ▶ develop knowledge of waste and its environmental impact
- ▶ explore their own response/values to the issue of waste/pollution in the oceans
- ▶ discover artists whose practice makes use of waste materials
- ▶ experience the role art can play in communicating environmental sustainability issues
- ▶ make connections between the use and disposal of plastics and packaging and pollution of the marine environment

Key Competencies

Students will develop the key competencies of:

- ▶ **Thinking** by exploring creativity and decision making with materials
- ▶ **Managing self** by developing a 'can-do attitude' through ongoing risk taking during art making and experimentation with materials and processes
- ▶ **Participating and contributing** by sharing and building visual ideas together to support collaborative art making processes and creating an action plan
- ▶ **Language/symbols/texts** by responding to and interpreting texts, and recognising that artist choices in the creative process affect these aspects

Values

- ▶ Ecological sustainability, which includes care for the environment
- ▶ Innovation, inquiry and curiosity by thinking critically, creatively, and reflectively

IDENTIFYING THE ISSUES

Please note that not all of these activities are suitable for younger children. We urge you to view any websites and clips before referring material to your students.

View one or all of these clips with your class

North Pacific Gyre (with commentary)

<http://www.youtube.com/watch?v=FTurihxSTnl&feature=related>

North Pacific Gyre (with subtitles, no commentary)

<http://www.youtube.com/watch?v=Jqe6tOE9oHY&feature=related>

Clearing up marine debris (music only)

<http://www.youtube.com/user/NOAAOceanMediaCenter#p/u/33/BArs4rSm6k4>

- ▶ What are your thoughts after seeing this video?
- ▶ How do you feel after seeing this video?
- ▶ What stood out for you?
- ▶ If you were telling someone else about this video what would you say to them about it?
- ▶ Where does the rubbish/material come from?
- ▶ Consider
 - people's litter on the beach/streets/school blowing out to sea or washing into the storm water system
 - rubbish from boats
 - rubbish blowing out of rubbish bins or landfill
- ▶ What effects do you think this waste in the Pacific Ocean is having?
- ▶ Consider
 - what lives in the ocean?
 - what do people need the ocean for?

IDENTIFYING IMPACT ON MARINE LIFE SUCH AS THE ALBATROSS

This website has a large number of resources and activities designed to support learning about the Albatross

<http://school.albatross.org.nz>



IDENTIFYING THE IMPACT OF RUBBISH ON A SCHOOL/COMMUNITY

Discover impact of rubbish on a community

View video regarding Waitemata Harbour cleanup
<http://www.viddler.com/explore/WaitakereCC/videos/6/>

Identify how much rubbish is in your school

1 Give your students a map of your school. Explain that you are all going to collect rubbish from around the school for a science investigation

Ask them to work in pairs or groups to identify/mark areas/parts of the school that:

- ▶ They pick up the rubbish from
- ▶ Feed into the water supply e.g. drains
- ▶ Rubbish collection/disposal places

2 As a class, empty all of the rubbish collected onto a tarpaulin

3 Sort/classify it and record on a graph

4 Sort the items of waste found into a waste time line, estimating which items will break down earlier than others and the time periods that might take

Ask:

- ▶ What are your thoughts after collecting this data?
- ▶ How do you feel?
- ▶ What stood out for you?
- ▶ If you were telling someone else about what you have investigated today, what would you say to them about it?
- ▶ Where does the rubbish/material come from?
- ▶ What can you/we do to reduce the waste that pollutes our waterways and oceans?
- ▶ How could you tell/communicate the issue and some solutions to others?

Students could keep a rubbish log (see page 10) for a week or longer to reflect on their personal impact

Ask them to predict how much rubbish they will produce. At the end of each week ask them to reflect how they could reduce the amount of rubbish they produce/dispose of. You could extend this to the students looking at their family's/whanau habits.

- ▶ Students share experiences with recycling and knowledge about reducing waste, before using a consequence wheel activity to identify the underlying issue(s) for why there is 'waste'
- ▶ Students could record/draw: what is unwanted material/rubbish for us at school?





EXPLORE HOW ART CAN COMMUNICATE THE ISSUE OF POLLUTION IN OUR OCEANS

View artwork by Skeleton Sea made from recycled materials

These are the artists who will be working with the Volvo Ocean Race at the Auckland Stopover to develop sculptures in March 2012.

<http://www.skeletonsea.com/art/>

As a whole class, view images of artwork by Skeleton Sea set out around the room

Students use post-its to record and post their initial ideas and questions around the images.

Use these questions to prompt students as they view the images

- ▶ What do you see?
- ▶ Have you seen anything like this before?
- ▶ What might it be made of?
- ▶ What is the first thing you notice and why?
- ▶ Why might an artist make this?

Excerpt from "Transform- a visual arts based investigation of waste"

<http://efs.tki.org.nz/Curriculum-resources-and-tools/Learning-Experiences> 10/9/2011

Now ask students to choose one image that stood out to them

Ask them to read the other post-its. Do others share their ideas? If not, how have their own ideas been challenged or changed?

Students could then work in pairs or small groups to view an image more closely

Use these questions to prompt students as they view the images

- ▶ How might it have been made?
- ▶ What is the first thing you noticed?
- ▶ What colours, shapes, sizes, textures and patterns do we see?
- ▶ What does this artwork remind you of...?
- ▶ How does it make you feel?
- ▶ If you could speak to Skeleton Sea, what would you ask them about this artwork?

(Refer to Exploring the Visual Arts Years 1-6 (MoE, 2002) for different categories of questions such as Description, Formal Analysis, Interpretation, Evaluation)

As a class

- ▶ What kind of thinking have we been doing to look at and discuss the works?
- ▶ What kind of thinking did Skeleton Sea have to do to make this?



As a class

- ▶ Brainstorm where we think Skeleton Sea's materials might have been sourced
- ▶ As a class, brainstorm some ideas for why Skeleton Sea used these materials

In pairs/small groups or individually, give students the opportunity to transform waste materials they have gathered

Students do not need to make recognisable objects from the waste; simply change and transform the appearance and structure

Items such as yoghurt containers, egg cartons, plastic bottles, bottle tops and straws are ideal for this. Students also need to be able to cut safely.

Students transform a waste object by considering some of the following processes:

- ▶ Make the outside the inside
- ▶ Notice and change the corners, edges and surfaces by cutting away, joining up, flattening or folding
- ▶ Rearranging any text on the container
- ▶ Closing up openings and opening up planes
- ▶ Changing the scale of some parts to the whole; bridging gaps; spacing things out; layering parts etc

Excerpt from "Transform- a visual arts based investigation of waste"

<http://efs.tki.org.nz/Curriculum-resources-and-tools/Learning-Experiences> 10/9/2011

- ▶ To encourage a range of ways to transform, you could record the ideas students are using and ask students to share work in progress during the session (photograph, video, list on board/paper)
- ▶ During the making process, regularly ask students to stop what they are doing and get up to view what others are doing

After completing their artwork, students could then share their processes for transforming the waste in pairs and reflect on:

- ▶ Unexpected outcomes
- ▶ How their ideas changed during the process

An 'art gallery walk-through' can take place to view the range of work around the room

Students then present and place their sculpture as a whole group or in small groups.

Ask each student to reflect on:

- ▶ What art ideas did we use for choosing how to place our work with others?
- ▶ What messages might people looking at our work take away about waste in our environment?





DISCOVER THE VOLVO OCEAN RACE

Visit www.volvooceanrace.com to read all about the Race, follow the progress of the boats, watch video shot by the Media Crew Members onboard and much more.

Sign up as a class/small teams to the Volvo Ocean Race Game (minimum age 13)

Link this to your literacy programme by asking students to write/present press releases regarding their progress each day/weekly.
<http://www.volvooceanracegame.org>

Follow the progress of Camper with Emirates Team New Zealand. Plot the team's progress on a world map.

<http://etnzblog.com/#!ocean>

In small groups/teams make boats out of waste materials and have your own class competition

See these websites below for ideas:

<http://www.royalsociety.org.nz/teaching-learning/bp-challenge/challenges/racing-yacht/>

<http://www.create-kids-crafts.com/sailboat-crafts-for-kids.html>

http://www.pbs.org/parents/curiousgeorge/activities/pdf/cc_buildsailboat.pdf

- ▶ Ask students/groups to reflect on:
 - Unexpected outcomes
 - How their ideas/design/skills changed during the process
 - What worked/didn't work well for their team
- ▶ Teacher could record student ideas on what works/doesn't work well for team work.



THE SKELETON ART COMPETITION

The Auckland Stopover is organising a Skeleton Art competition for schools across the country, in conjunction with the *Keep the Oceans Clean!* programme of learning.

THE AUCKLAND STOPOVER SKELETON ART COMPETITION

Win an overnight trip to the Auckland Stopover Race Village and 1,000 postcards of your sculpture!

- ▶ Open to Years 4 – 8 (individual, group or class entries)
- ▶ The challenge is to create a Skeleton Art sculpture (any size or dimension) using waste and/or natural materials gathered at a beach or waterway clean-up
- ▶ Photograph the sculpture and upload the image to the www.volvoceanraceauckland.com website (entry form and upload process can be found at <http://www.volvoceanraceauckland.com/schools.php?id=3>)
- ▶ 1,000 postcards of the winning entry will be printed and given to the winning school for private use, to give away or to sell as a school fundraiser
- ▶ The winner or a representative from the winning group entry will win an overnight trip to Auckland, with an adult companion. Accommodation and flights (if required) will be provided
- ▶ The winner will have a personal tour of the Race Village, meet the Skeleton Artists and present a set of the winning postcards to the skipper and crew of Emirates Team New Zealand entry CAMPER
- ▶ All six teams in the Volvo Ocean Race will be given a set of the postcards to use so the winning design will be sent all around the world

Rules and full terms and conditions available on www.volvoceanraceauckland.com





Skeleton Sea artwork
created at Alicante Race Village
Saludos del Mar – Greetings from the Sea

CREATING SKELETON ART

- ▶ Explain the competition to the students
- ▶ Review the requirements and develop a criteria list
- ▶ Consider the purpose/message of the competition, where/how the final sculptures could be exhibited and who the audience will be
- ▶ How will they get their message across?
- ▶ Ask students to use at least two sculptural problem solving ideas

Alongside this art-making, students could build further knowledge by researching how different artists have used other processes and recycled materials to communicate environmental messages

For example: clean up our oceans or save the oceans etc. They should also consider how the artists have used their process to take action for the environment

Discuss

- ▶ Local community examples of public sculptures, including installations, time based and site specific work (Understanding the Arts in Context)
- ▶ Examples of local waste issues such as the playground/seashore/local river and globally, such as the North Pacific plastic gyre tinyurl.com/dhn9vm and its impact
- ▶ Chris Jordan: consumerism <http://www.chrisjordan.com/gallery/rtn2/#gyre>
- ▶ Angela Haseltine Pozzi: pollution in the oceans <http://www.marinemammalcenterart.org>
- ▶ Exploring the Visual Arts: Fabric and Fibre (book and posters: MoE, 2001) Fibre artist Heeni Kerekere is featured in this resource and it provides an example of the sustainable use of materials that relates to a Maori world view of environment

Students identify and review their own ideas and concerns about unwanted materials to consider the following question

What action could we take to minimize the impact of waste in the oceans?

A decision-making matrix or an action plan from <http://efs.tki.org.nz/Curriculum-resources-and-tools/Teaching-Tools> could be created to support this outcome.

For example:

Could our transformed waste sculptures be part of taking action for our oceans and waterways and what would we want to achieve?

Consider how we could work together as an artist collective:

- ▶ What might we need to find out about a suitable and available site for our work?
- ▶ How do others use that space so that we know how the community could experience the work?
- ▶ What is our process for generating ideas, then selecting and refining a design to communicate an intention (Developing Ideas, Developing Practical Knowledge)
- ▶ Installing the work on the site: possibilities could include it becoming a time based artwork that is shifted around to make it more interactive e.g. a sculpture that incorporates different recycling stations so it changes and encourages participation
- ▶ How might we document and gather feedback from school community about their responses to the work (Communicating and Interpreting, Understanding the Arts in Context)
- ▶ What roles could we take on to share the project as a way to coach other classes about taking action with art?

Excerpt from "Transform- a visual arts based investigation of waste"

<http://efs.tki.org.nz/Curriculum-resources-and-tools/Learning-Experiences> 10/9/2011

FACTIVITIES

Cut the facts up and sort them into groups of similar facts

- ▶ Give these similar facts a heading
- ▶ Can you arrange the facts into paragraphs that make sense?
- ▶ Can you research and add more facts?

Around 70% of the Earth's surface is covered by oceans.

During the Race, the crews will experience life at the extreme: no fresh food is taken onboard so they live off freeze dried fare. They will experience temperature variations from -5 to +40 degrees celsius and will only take one change of clothes. They trust their lives to the boat and the skipper and experience hunger and sleep deprivation.

The Albatross feeds on fish and shrimp.

New Zealanders create 3.6million tonnes of rubbish every year. That is the same weight as 400,000 buses! 60% of this rubbish is plastic.

The world's oceans contain enough water to fill a cube with edges over 1000 kilometres (621 miles) in length.

The Albatross are the largest seabirds in the world and are also one of the largest flying birds.



Each of the Race teams has a crew of 11 professional sailors. They will race day and night for more than 20 days on some of the Race legs.

Some plastic rubbish in ocean has come from people's fishing activities on and beside the water.

Ocean tides are caused by the Earth rotating while the Moon and Sun's gravitational pull acts on ocean water.

There are hundreds of thousands of known marine life forms. Some scientists believe there could actually be millions of marine life forms still to be discovered.

During the nine months of the Volvo Ocean Race, which starts in Alicante, Spain in October 2011 and concludes in Galway, Ireland, during early July 2012, the teams will sail over 39,000 nautical miles through the world's most treacherous seas.

Oceans are a vital means of transport for shipping products across oceans from one port to another.



Fishing line, netting, rope and other plastic rubbish entangle and strangle an estimated 100,000 marine mammals and turtles every year.

The largest ocean on Earth is the Pacific Ocean; it covers around 30% of the Earth's surface.

This remarkable bird drinks sea water which has a very high concentration of salt.

The Pacific Ocean's name has an original meaning of 'peaceful sea'.

From wingtip to wingtip the Royal Albatross is 3.5 metres wide. Its cousin, the Wandering Albatross, is 3.2 metres from wingtip to wingtip!

The Mariana Trench located in the western Pacific Ocean is the deepest known area of Earth's oceans at around 1,1000 metres (3,6000 feet). That's 33 ½ Sky Towers stacked end to end!



Add your own facts below

There are around 25,000 different islands in the Pacific Ocean – that's many more than in Earth's other oceans.

The Race became a reality in 1973 with The Whitbread Round the World Race. Today the Race is known as the Volvo Ocean Race.

The great dangers of the Race were realised when three sailors were lost at sea after being washed overboard in the very first edition of the Race in 1973.

BACKGROUND INFORMATION

VOLVO OCEAN RACE

The Volvo Ocean Race is the world's toughest sailing event, an exceptional test of sporting and human endeavour featuring the elite of the sailing profession. It is a nine month marathon passing through four oceans and five continents, and it will push the athletes to the limits of endurance.

In the 38 years since its inception, the Race has evolved considerably from the Corinthian adventure of the original Whitbread Race, to the big budget, fully professional campaigns that typify the Volvo Ocean Race today.

Inspired by the achievements of the British singlehanded circumnavigator Robin Knox-Johnston in the 1969 Sunday Times Golden Globe Race, Guy Pearce and Anthony Churchill took their fledgling plans for the first fully crewed race around the

world to Admiral Otto Steiner of the British Royal Naval Sailing Association. Convinced of its potential, Steiner enlisted the help of brewery boss Colonel Bill Whitbread. As legend has it, the pair met in a smoky Portsmouth pub to flesh out the fine details, announcing soon after that the first ever Whitbread Race would take place in 1973.

Rebranded in 2001 by its new owners as the Volvo Ocean Race, the 2011-12 Race will be the 11th edition of this iconic sailing regatta.

The 2011/12 Race will start in the Spanish port of Alicante in October 2011 and finish in Galway, Ireland in July 2012. On the way, the Race will visit Cape Town (South Africa), Abu Dhabi (UAE), Sanya (China), Auckland (New Zealand), Itajaí (Brazil), Miami (USA), Lisbon (Portugal) and Lorient (France).



This time the Race will be contested by six boats, each with 11-strong crews of professional sailors, who will experience temperatures ranging from -15 to +40 degrees celsius over the course of the Race. The crews trust their lives to the boat skipper and experience hunger and severe sleep deprivation on legs lasting as long as 22 days. No fresh produce is taken on board during the Race, meaning the teams will survive on freeze-dried food.

The push for even small advantages means the sailing teams are the forefront of technological advantages in the industry. The teams will compete in state-of-the-art Volvo Open 70s, the fastest monohull racing yacht in the world. The current monohull speed record was set by the Volvo Open 70 Ericsson 4 during the 2008-09 Race, with the boat covering 596 nautical miles in 24 hours.

One of the most demanding team sporting events in the world, the Race presents a unique blend of high-tech glitz, offshore endurance and edge-of-the-seat adventure.

To find out more about the race go to:
<http://www.volvooceanrace.com/>

WHAT IS A GYRE?

A gyre is any type of vortex or whirling mass in the air or the sea that draws everything in it towards its centre. It is most commonly used to describe any large system of rotating ocean currents. While there are many gyres around the world, the five most noteworthy are the Indian Ocean Gyre, North Atlantic Gyre, North Pacific Gyre, South Atlantic Gyre and the South Pacific Gyre.

The North Pacific Gyre is of particular concern environmentally. Two garbage patches connected by a current have been identified within it. The eastern garbage patch is located between Hawaii and the coast of the state of California, USA. The western garbage patch is situated off the coast of Japan.

You can demonstrate the gyre/ garbage patch effect

Simply stir a tub of water with confetti or rice sprinkled on the surface in a constant circular motion.

These areas are referred to as garbage patches due to the high concentration of marine debris. Just how much marine debris and how far it is spread can be difficult to track. Even satellite images are unreliable as much of the debris is broken down into tiny pieces of plastic - some the size of plankton! Scientists use sampling to determine the constantly changing size of the gyres. It is estimated that the garbage patch in the North Pacific Gyre covers an area the size of Texas (696,200 km²). This is approximately 2 1/2 times the size of New Zealand (268,680 km²).

These garbage patches are a huge threat to all marine life. It is estimated up to 90% of the marine debris is plastic.

LEARN ABOUT PLASTIC

We use plastic every day, from the packaging used on so many items to the carpet under our feet. Plastic means easy to bend or mold. All plastics are made from hydrocarbon molecules. These long molecules are very flexible thanks to the carbon atoms present in them.

Most plastics are petroleum oil based and include:

Name of plastic type	Commonly used for...
Polyethylene	plastic bags
Polyester	clothing
Polyethylene terephthalate (PET)	drink bottles
Polystyrene	takeaway food trays
Nylon or Polyamide	stockings, windbreakers
Polyvinyl chloride (PVC)	drainpipes, computer casings
Acrylic	paint, fake fur
Polypropylene	carpets, drinking straws, car interiors, toothbrushes
Polyurethane insulation	foam mattresses,
High-density polyethylene	detergent bottles
Kevlar	helmets, bullet proof vests

Some plastics are plant-based or made from cellulose. These can include cellophane, celluloid film and rayon (for fabric).

Plastic is now a huge part of our everyday life so it is inevitable that it will find its way into our waterways and eventually the oceans.

When plastic finds its way into the ocean, it eventually breaks up into microscopic particles that will be ingested by marine life thereby finding its way into the food chain. We sit at the top of the food chain.

Some scientists now believe that plastics such as polystyrene decompose in the ocean leaving behind chemical pollution in the form of styrene trimer and bisphenol A. These chemicals have been linked to reproductive disorders, (Barry, 2009).

Even before plastic debris in the oceans breaks down, it poses a significant threat to marine life. Plastic debris such as plastic shopping bags and bottle tops look like small tasty marine animals on which many marine animals feed.

Turtles are known to mistake plastic shopping bags for jelly fish, one of their favourite foods.

Research suggests 44% of seabirds mistakenly eat plastic debris, sometimes with fatal consequences.

Plastic has no nutritional benefit and it cannot be digested. Plastic damages the digestive system of animals and can remain in their gut fooling the animal into feeling full, eventually leading to malnutrition or starvation.

We can all take action to prevent plastic becoming marine debris

Some suggestions include:

- ▶ Reducing the amount of plastic you use; opt for woven shopping bags made from recycled plastics
- ▶ Reuse plastics whenever you can rather than throwing them away. For example, don't throw plastic drink containers away. Reuse them!
- ▶ Recycle plastics to ensure they are disposed of safely or recycled into new products
- ▶ Pick up rubbish and ensure it is correctly disposed of
- ▶ Keep our waterways and coastlines clean – look for beach/waterway cleanups in your community or start one!



SAVE THE ALBATROSS

New Zealand is known as the albatross capital of the world as it is a breeding ground for more than 13 of the world's 22 albatross species.

Albatross have hooked beaks with nostrils sheathed in prominent horny tubes at the base of their bill.

Albatross evolved to be able to swallow salt water when feeding. They have a salt gland behind each eye that removes excess salt from their blood. The excess salt drains from the tubes in their bill making it appear they are crying.

Maori call the albatross toroa. The toroa represents beauty and power, making the white feathers of the albatross valued treasures for Maori. Maori legend describes the salty tears rolling down the bill as the toroa weeping for its oceanic home, (Sagar, 2009).

Albatrosses are remarkable for many reasons:

- ▶ Albatross are the largest seabirds in the world and are also one of the largest flying birds
- ▶ Some species of albatross live very long lives – from 60-62 years – making them among the longest living birds
- ▶ Albatrosses spend up to 80% of their life living at sea – they sleep on the surface of the sea!
- ▶ They bond with one mate for life. Albatrosses return to land to breed – usually to the same breeding ground they were born! They usually begin breeding at around 6-15 years old and will only lay one egg per breeding season
- ▶ They can fly at speeds of up to 130-140km per hour. That's 30-40 km per hour more than the highest speed a car is allowed to travel on New Zealand roads!
- ▶ Albatrosses can travel up to 1800km per day when migrating
- ▶ The Royal Albatross is the largest of the albatross species with a wingspan of 3.5 metres!

Sadly the Albatross species are endangered due to a number of reasons:

- ▶ Low reproductive rates
- ▶ Albatross scavenge around fishing vessels making them very prone to becoming ensnared in longline hooks and collision with trawl warps
- ▶ Predators such as stoats, cats and dogs impact badly on breeding grounds
- ▶ Pollution of the oceans including marine debris and toxin

To understand the impact of marine debris

View the trailer for the film Midway as a group of environmentalists, scientists and filmmakers document the environmental tragedy unfolding on Midway Atoll, an isolated isle in the middle of the Pacific Ocean.

<http://www.midwayfilm.com>

WARNING This is a very hard-hitting trailer and would not be suitable for younger children. We urge you to view it before referring it to your students.

WHO'S TAKING ACTION?

Fabien Cousteau

In April 2009, oceanographic explorer Fabien Cousteau exposed the truth about the world's largest trash dump—the Great Pacific Garbage Patch.

Estimated to be twice the size of Texas, this trash swirl stretches across the Pacific Ocean from the coast of California to Japan. In some places, the debris is 90 feet deep.

<http://www.oprah.com/world/Ocean-Pollution-Fabien-Cousteaus-Warning-to-the-World>

<http://www.youtube.com/watch?v=XxNqzAHGXvs&feature=related>

David de Rothschild

Shocked by stories of the ecological catastrophe known as the Pacific Garbage Patch, British explorer David de Rothschild was inspired to build a boat made of 12,500 plastic bottles and other recycled materials. He named it The Plastiki. He and a small team of environmentalists set sail on a voyage across the Pacific Ocean from San Francisco to Sydney to get people to rethink waste as a resource.

www.theplastiki.com

Sir Peter Blake Trust

The Sir Peter Blake Trust aims to help New Zealanders make a positive difference for the planet through activities that encourage environmental awareness and action, and leadership development. The Trust wants to carry on Sir Peter's work and keep his spirit and values alive for future generations.

"Having vision is not enough. Change comes through realising the vision and turning it into a reality."

Sir Peter Blake

Forest and Bird

Forest & Bird is committed to improving protection of native wildlife and environments on land and sea.

www.forestandbird.org.nz

Go Bamboo!

A Gisborne family was so disturbed by images of the Great Pacific Garbage Patch that they decided to take action to limit the amount of plastic ending up in the oceans, on our beaches or in landfill. They created Go Bamboo and now produce a range of 100% biodegradable, sustainable household products made of bamboo. Read about their work and a special fundraising offer for schools at

www.gobamboo.co.nz

World Wildlife Fund WWF

http://wwf.panda.org/about_our_earth/blue_planet/problems/problems_fishing/

Waitemata Harbour Clean-Up Trust

Formed in 2002, the Waitemata Harbour Clean-Up Trust is a charitable organisation that oversees the removal of litter from Auckland's Waitemata Harbour and inner gulf islands, and promotes the concept of clean, clear rubbish-free waterways.

<http://www.waitakere.govt.nz/ourpar/whct.asp#type>

RESOURCES

LINKS

These websites are sources of more information. The Volvo Ocean Race Auckland Stopover does not endorse these sites but includes them as possible research starting points. Teachers should check websites themselves before referring them to their students.

Auckland Council

Waste education for schools with great links to activities, resources etc

<http://www.aucklandcity.govt.nz/council/services/rubbish/schools.asp>

Guardians of the Mauri video

EnviroEd@waitakere.govt.nz

BBC News – Science and Nature

<http://www.bbc.co.uk/sn/>

Bell Museum distance learning

The Watershed Game

<http://www.bellmuseum.umn.edu/games/watershed/>

Department Of Conservation

News and resources based around waterways and native freshwater fish

<http://www.doc.govt.nz/>

Enviro Schools

Enviroschools kit: Healthy Water (all Enviroschools should have this)

Environment Waikato

Rivers and Us programme and resources

<http://www.waikatoregion.govt.nz/Services/Regional-services/For-schools/Resources-for-teachers/Classroom-units/Rivers-and-us/>

Friends of the Whau

The Whau, our streams, our river, our backyard

<http://www.waitakere.govt.nz/abtcit/ei/pdfs/environment/thewhau.pdf>

KK14 Up Along the Coast

Greater Wellington Regional Council

Take Action for Water resource kit for Year 5 – 8 students

<http://www.gw.govt.nz/take-action-for-water>

National Waterways Project

Information and resources for schools.

<http://nwp.rsnz.org/content/index.htm>

Project Twin Streams Action Toolkit

<http://www.projecttwinstreams.com/multimedia/actiontoolkit/>

Sea Keepers

Resources on how we use water and the harm we do.

<http://www.seakeepers-nz.com/>

Sir Peter Blake Trust

Excellent programmes and resources focussed on environmental issues, coastal cleanups, leadership and teamwork.

<http://www.sirpeterblaketrust.org/>

Te Ara – The Encyclopaedia of New Zealand

Good information specific to albatross in New Zealand Aotearoa

<http://www.teara.govt.nz/en/albatrosses/1>

BOOKS

Exploring the Visual Arts Years 1-6 (MoE, 2002)

CN3 2004 Wonderful Water

SJ P4 No 3 2008 Estuary Health Check

SJ P1 1990 Rain in the Hills

SJ P2 No 3 Testing the North River

The Waterways: How Rivers and Streams Work (Building Science Concepts series 2000)

Water Water Everywhere by Henry Pluckrose

MUSIC

Kiwi Kids Songs- Environmental Education

KK2 I've Got the Greens

KK2 21st Century

KK2 So Little Time

KK2 Yesterday Tomorrow

KK3 Land of the Free

KK7 Look Through My Eyes

KK11 Dream World

KK12 Sea Song

KK13 Just One Earth

KK14 I Dream Amongst Ferns

REFERENCES

Barry, C, 2009. Plastic Breaks Down in Ocean, After All – And Fast. National Geographic News, August 20, 2009

Paul Sagar. 'Albatrosses – Albatrosses', Te Ara - the Encyclopedia of New Zealand, updated 2-Mar-09

<http://www.TeAra.govt.nz/en/albatrosses/1>

Ministry of Education "Transform – a visual arts based investigation of waste",

<http://efs.tki.org.nz/Curriculum-resources-and-tools/Learning-Experiences> 10/9/2011

NOTES

www.volvoceanraceauckland.com

Skeleton Sea artwork
created at Alicante Race Village
Saludos del Mar – Greetings from the Sea

