

# Beneath the Waves

Protecting Marine Wildlife



**"Join me and IFAW  
in taking action for  
animals."**

**Leonardo DiCaprio**  
Actor and Activist



# Beneath the Waves

## How to Use This Programme

*Beneath the Waves: Protecting Marine Wildlife* aims to educate pupils about the vital importance of maintaining a healthy ocean ecosystem, protecting marine wildlife, and about the threats to this spectacular world that lies beneath the waves: hunting, over-fishing, pollution, oil spills, and global warming. Here's one possible approach to teaching this programme:

### 1. Introduce Topic and Develop Content Knowledge *Film at* *vimeo.com/3109930; Worksheet 1: Film Quiz*

- **Film** View the film with the class to build background and tap into pupils' prior knowledge about ocean ecosystems, marine wildlife, and human activities that affect the oceans. After viewing, ask pupils to take the film quiz on the next page.
- **Pupil Magazine** (on page 13) Use the magazine before or soon after viewing the film. Have a class discussion about what pupils learned from the film or the magazine.

### 2. Conduct Lesson Activities *Lesson Plans and Worksheets*

- **Lessons 1 and 2 and Worksheet 2: Compare Whales and Fish.** Pupils will use research skills and role-play to learn facts about whales and how they find their food. The lesson and activities build on content delivered on Pupil Magazine pages 13–18.
- **Lesson 3 and Worksheet 3: Turtletown News** presents pupils with a news article to extract facts and opinions about the issues and perspectives around threats facing turtles.
- **Lesson 4 and Worksheet 4: Clean it up!** focus on helping pupils learn how plastic affects the ocean ecosystem. They build on content found on page 16 of the Pupil Magazine.

## Meeting Curriculum Aims

This resource meets programmes of study in science, geography, maths and English.

## Companion Film

The *Beneath The Waves* companion film is an excellent introduction to the content and concepts presented in this teaching guide. Narrated by actor and environmentalist Leonardo DiCaprio, the film runs for about 15 minutes and is appropriate for general youth audiences at [www.vimeo.com/3109930](http://www.vimeo.com/3109930)

## Online Resources

IFAW's Animal Action education programmes offer a wealth of free teaching resources about animals and the environment: [www.ifaw.org/education](http://www.ifaw.org/education)

## Animal Action Education

IFAW's Animal Action Education programme offers free resources focusing on animals and the environment. Curriculum-linked education materials are locally adapted for free distribution in eight languages and 20+ countries, reaching more than 5,000,000 young people worldwide each year. For more information about IFAW and the Animal Action Education programme, email [animalactionweek@ifaw.org](mailto:animalactionweek@ifaw.org), or call 0207 587 6700.



International Fund for Animal Welfare

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## Ocean Literacy

Although we have used the commonly referenced term 'the oceans' throughout this resource, we are actually referring to the entire ocean; one global interconnected body of salt water with many ocean basins such as the North Pacific, South Pacific, North Atlantic, South Atlantic, Indian and Arctic. The ocean is not only rich with life – it also provides the perfect lens for covering material in science, maths, English and more. Use these materials to incorporate the following essential principles of ocean literacy into your classroom:

1. The Earth has one big ocean with many features.
2. The ocean and life in the ocean shape the features of the Earth.
3. The ocean is a major influence on climate.
4. The ocean makes the Earth habitable.
5. The ocean supports a great diversity of life and ecosystems.
6. The ocean and humans are inextricably linked.
7. The ocean is largely unexplored.

### Go Online

Go to: [www.ifaw.org](http://www.ifaw.org)  
Click on 'Our Work' and 'Defending Whales'



# Links to the Key Stage 2 National Curriculum

## ENGLISH

### Spoken Language

#### Years 1 – 6 pupils should be taught to:

- ask relevant questions to extend their understanding and knowledge
- use relevant strategies to build their vocabulary
- articulate and justify answers, arguments and opinions
- give well-structured descriptions, explanations and narratives for different purposes, including for expressing feelings
- maintain attention and participate in collaborative conversations, staying on topic and initiating and responding to comments
- use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas
- speak audibly and fluently with an increasing command of Standard English
- participate in discussions, presentations, performances, role play, improvisations and debates
- gain, maintain and monitor interest of the listener(s)
- consider and evaluate different viewpoints, attending to and building on the contributions of others
- select and use appropriate registers for effective communication.

### Reading – word reading

#### Years 3 – 6 pupils should be taught to:

- apply their growing knowledge of root words, prefixes and suffixes (etymology and morphology) as listed in English Appendix 1, - both to read aloud and to understand the meaning of new words they meet
- read further exception words, noting the unusual correspondences between spelling and sound, and where these occur in the word.

### Reading – comprehension

#### Years 3 – 6 pupils should be taught to:

- develop positive attitudes to reading and understanding of what they read by:
  - listening to and discussing a wide range of fiction, poetry, plays, non-fiction and reference books or textbooks
  - reading books that are structured in different ways and reading for a range of purposes.
- understand what they read in books they can read independently by:
  - checking that the text makes sense to them, discussing their understanding and explaining the meaning of words in context
  - identifying main ideas drawn from more than one paragraph and summarising these
  - identifying how language, structure, and presentation contribute to meaning.
- retrieve and record information from non-fiction.

#### In addition, Years 5 and 6 pupils should also:

- participate in discussions about books that are read to them and those they can read for themselves, building on their own and others' ideas and challenging views courteously
- explain and discuss their understanding of what they have read, including through formal presentations and debates, maintaining a focus on the topic and using notes where necessary.

### Writing – composition

#### Years 3 – 4 pupils should be taught to:

- plan their writing by:
  - discussing writing similar to that which they are planning to write in order to understand and learn from its structure, vocabulary and grammar
  - discussing and recording ideas.
- draft and write by:
  - composing and rehearsing sentences orally (including dialogue), progressively building a varied and rich vocabulary and an increasing range of sentence structures
  - in non-narrative material, using simple organisational devices [for example headings and sub-headings].

#### Years 5 – 6 pupils should be taught to:

- plan their writing by:
  - identifying the audience for and purpose of the writing, selecting the appropriate form and using other similar writing as models for their own
  - noting and developing initial ideas, drawing on reading and research where necessary.
- draft and write by:
  - using further organisational and presentational devices to structure text and to guide the reader [for example headings, bullet points, underlining].

### Writing – vocabulary, grammar and punctuation

#### Years 3 – 6 pupils should be taught to:

- Develop their understanding of the concepts set out in the primary national curriculum English Appendix 2 by:
  - learning the grammar for years 3 - 6 in English Appendix 2
- use and understand the grammatical terminology in English Appendix 2 accurately and appropriately when discussing their writing and reading.

# Links to the Key Stage 2 National Curriculum

## SCIENCE

### Working scientifically

**Pupils should be taught to use the following practical scientific methods, processes and skills:**

- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using straightforward scientific evidence to answer questions or to support their findings.

### Animals, including humans

**Year 3 pupils should be taught to:**

- identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat
- identify that humans and some other animals have skeletons and muscles for support, protection and movement.

**Year 4 pupils should be taught to:**

- construct and interpret a variety of food chains, identifying producers, predators and prey.

### Living things and their habitats

**Year 4 pupils should be taught to:**

- recognise that living things can be grouped in a variety of ways
- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- recognise that environments can change and that this can sometimes pose dangers to living things.

**Year 6 pupils should be taught to:**

- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics.

## Evolution and inheritance

**Year 6 pupils should be taught to:**

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

## GEOGRAPHY

Key Stage 2 pupils should extend their knowledge and understanding beyond the local area to include the United Kingdom and Europe, North and South America. This will include the location and characteristics of a range of the world's most significant human and physical features. They should develop their use of geographical knowledge, understanding and skills to enhance their locational and place knowledge.

**Pupils should be taught to:**

### Locational knowledge

- name and locate counties and cities of the United Kingdom, geographical regions and their identifying human and physical characteristics, key topographical features (including hills, mountains, coasts and rivers), and land-use patterns; and understand how some of these aspects have changed over time.

### Human and physical geography

- describe and understand key aspects of:
  - physical geography, including: climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle
  - human geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water.

## PSHE

### Non-statutory Personal, Social, Health and Economic Education

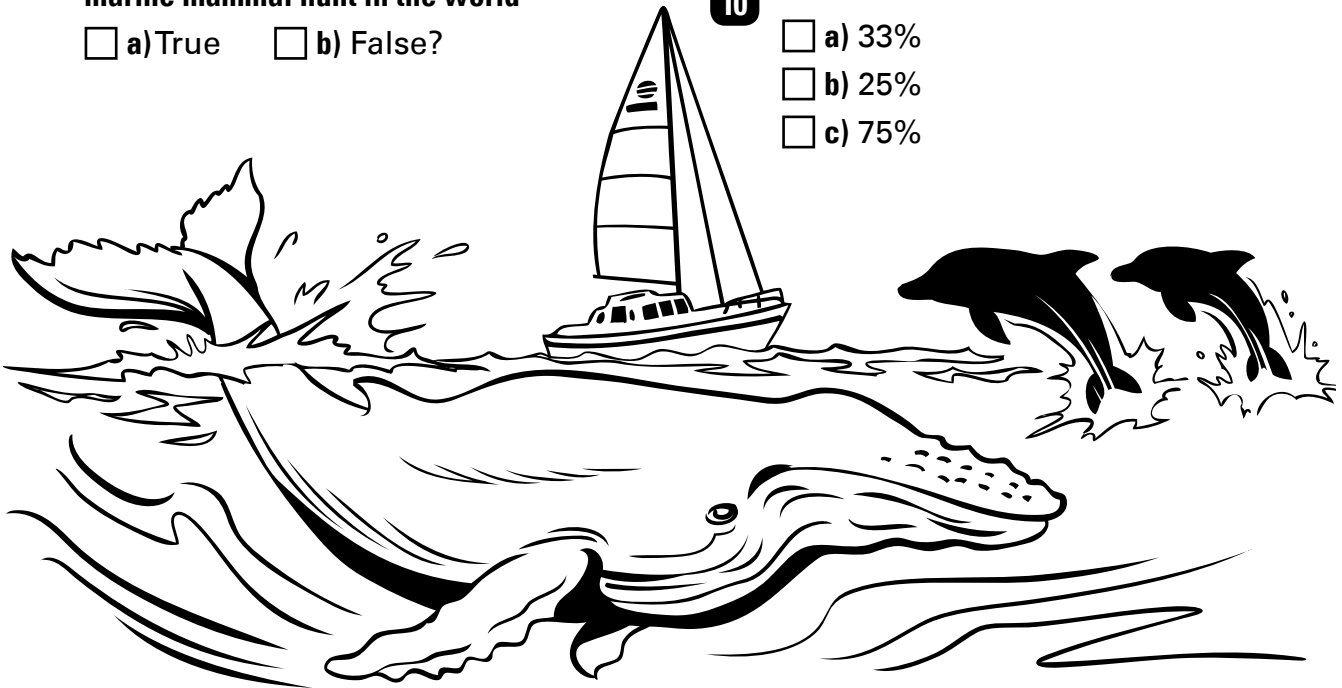
The non-statutory nature of Personal, Social, Health and Economic Education offers the opportunity to creatively explore the three core themes of the subject through the lens of animal welfare and conservation as well as human interaction with animals. The PSHE Association identifies the following core themes for PSHE Education:

- Health and Wellbeing
- Relationships
- Living in the Wider World

What do you remember about the film you have just seen?

Tick the correct answers below

- 1** The earth was formed  
☐ a) 4.5 billion years ago  
☐ b) 4.5 million years ago  
☐ c) 4 million years ago
- 2** Some countries still hunt and kill whales  
☐ a) True    ☐ b) False
- 3** More than 100 million sharks are killed every year  
☐ a) True    ☐ b) False
- 4** The world's largest creature is  
☐ a) the African elephant  
☐ b) the blue whale  
☐ c) the basking shark
- 5** Africa is responsible for the biggest marine mammal hunt in the world  
☐ a) True    ☐ b) False?
- 6** IFAW's research vessel is called:  
☐ a) *Song of the Sea*  
☐ b) *Song of the Dolphin*  
☐ c) *Song of the Whale*
- 7** Dolphins and porpoises can find food using echolocation.  
☐ a) True    ☐ b) False
- 8** The North Atlantic right whale is not one of the world's most endangered animals  
☐ a) True    ☐ b) False
- 9** Plastic lasts in the oceans for  
☐ a) one week  
☐ b) hundreds of years  
☐ c) ten years
- 10** How much of the earth is covered in water?  
☐ a) 33%  
☐ b) 25%  
☐ c) 75%



Answers: 1 a; 2 True; 3 True; 4 b; 5 False; 6 c; 7 True; 8 False; 9 b; 10 c.





# Lessons 1 and 2

## How Whales Measure Up • How Whales Find Food

**Learning Outcomes:** Pupils will apply research skills and role-play activities to learning about the physical structure of whale species and echolocation. This activity meets programmes of study in maths and science.

### How Whales Measure Up

Whales come in all shapes and sizes, from the relatively small pygmy whale to the great blue whale. In this activity, pupils will learn about the many different species of whales, and how their sizes compare.

#### What you need

- **Worksheet 2:** *Compare Whales and Fish*
- 30m of string or rope
- tape measure
- index cards
- tape
- markers

#### What to do

- Begin by sharing some basic facts about the similarities and differences between whales and fish. For instance, whales are mammals and they have hair and nurse their babies. Fish lay eggs and have scaly skin. Whales are warm-blooded; fish are cold-blooded. Do pupils know any other differences? Ask them to share.
- Distribute the *Compare Whales and Fish* reproducible worksheet.

Help pupils to cut out the whale and fish facts and paste them into the appropriate section on the Venn diagram.

- Next, see how big whales really are! Share these average lengths of species: pygmy whale (6m), gray whale (12m), humpback whale (15m), right whale (17m), fin whale (25m), and blue whale (30m). Write the lengths and names of each species on a separate index card.
- Next, gather in a large space, such as the school corridor or playground. Stretch the string or rope flat on the ground.
- Ask groups to take turns measuring the lengths of their whales using the tape measure. Tape the index cards to the appropriate spots on the rope.
- You might want to add index cards for other ocean animals so that pupils may make further comparisons.
- As an extension, invite groups to do further research on their species, finding more about each species' diet, habitat, and body structure. Ask groups to present this additional information on a poster.

### How Whales Find Food

Whales use a complex system of sounds called echolocation to locate and hunt their prey. This activity teaches pupils about echolocation and the delicate relationship whales have with their underwater environment.

#### What you need

Four blindfolds

#### What to do

- Begin by talking about the ways whales find food. Whales continually emit a sequence of tones and sounds. They listen for the tones to echo off the ocean floor, surface, rocks, and other sea life. The echoes tell whales about their environment and what's nearby.
- Next, demonstrate echolocation by inviting pupils to gather in a circle, representing the ocean. Ask two volunteers to stand in the middle and blindfold them. They are the whale and the shrimp. Ask four others also to join the middle; they will play the ocean floor, a rock, some seaweed and a boat.
- Ask the whale to call out 'whale,' using his or her deepest voice possible. The shrimp must respond by calling out 'shrimp' in his or her quietest voice. The others in the middle should also respond to the whale, using medium tones. The challenge is for the whale to find and tag the shrimp. Ask pupils to take turns playing the different roles.
- Ask pupils to discuss the activity. What was it like for the pupils who played whales to find the shrimp? How is it similar to the process whales use to find their prey? How is it different?

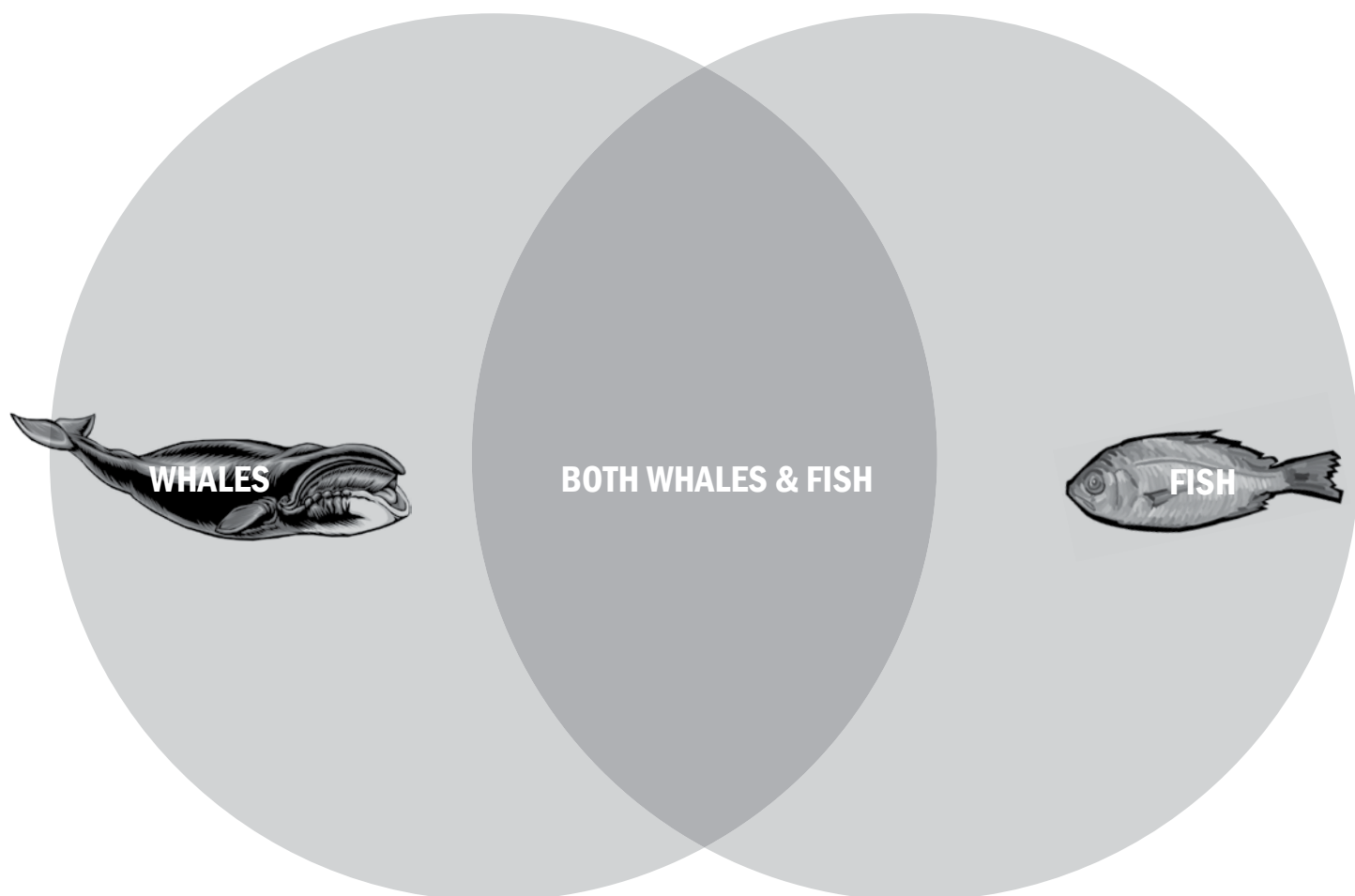
Because right whales are slow and swim close to shore, they are at risk of injury or even death from being struck by ships. To help prevent this, IFAW helped develop special acoustic monitoring buoys that can detect right whales and warn nearby ships of their presence.



# Compare Whales and Fish

**Did you know?** Whales and fish have many similarities but lots of big differences, too.

Cut out the attributes below, then paste them onto the appropriate place on the Venn diagram.



Cut out these attributes and paste them onto the Venn diagram.

<b>Some hair on skin</b>	<b>Have a brain</b>	<b>Most lay eggs</b>
<b>Swim</b>	<b>Scaly skin</b>	<b>Have a heart</b>
<b>Breathe air with lungs</b>	<b>Move tail left and right</b>	<b>Have a backbone</b>
<b>Breathe with gills</b>	<b>Move tail up and down</b>	<b>Are mammals</b>
<b>Live in water</b>	<b>Warm blooded</b>	<b>Nurse babies</b>
<b>Have fins</b>	<b>Mostly cold blooded</b>	<b>Do not care for young</b>





# Lessons 3

## Drama in Turtletown

**Learning Outcomes:** Pupils will read a news article to extract facts and opinion and go on to research a local environmental issue. This activity meets science and English programmes of study.

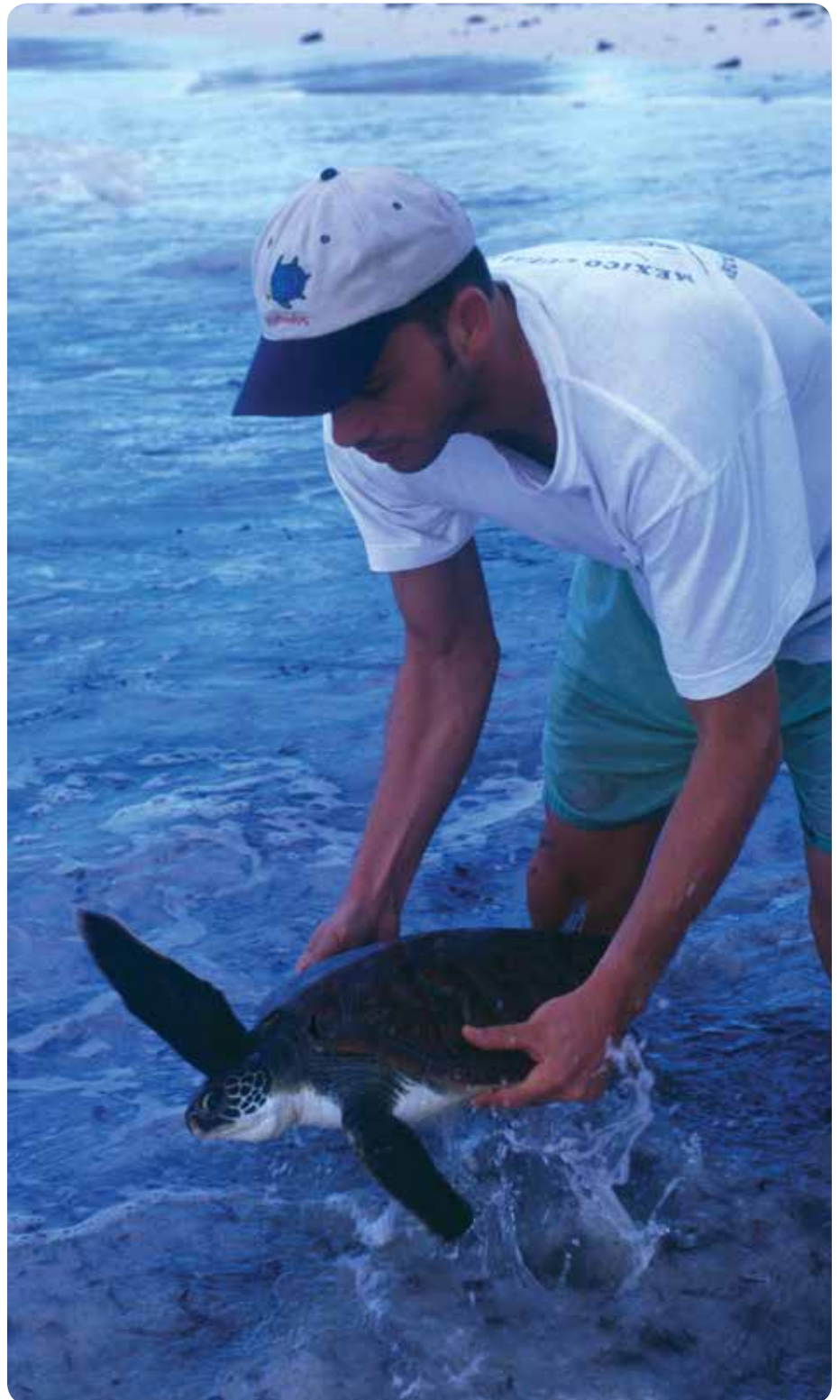
Turtles are just one undersea animal facing human and environmental threats. This activity asks pupils to think about the issues and perspectives that go into ocean life crises.

### What you need

- **Worksheet** *Turtletown News*
- Two different-coloured markers

### What to do

- Distribute the **Worksheet 3: Turtletown News**.
- Begin by talking about some of the features of a newspaper article. Can pupils predict what this fictional article will be about? What clues give readers information about the content of the article? (e.g., photos, headlines, deck)
- Read the article aloud, asking pupils to follow along. Were their predictions correct? If so, did pupils still find surprising information? If not, what was the main idea of the article? Would there be a better way to make the main idea more obvious at a glance?
- Discuss who is quoted in the article and why. Do the individuals quoted have the same opinions about turtles or different ones? If pupils were writing the article, are there other people they would interview? Who?
- Challenge pupils to go through the article once more, using one colour of highlighter to mark facts and the other colour to mark opinions. Then discuss what pupils marked as fact and what they marked as opinion. Are there differences?
- As an extension, encourage pupils to research an environmental issue in your community, form opinions about that issue and then write to the editor of your local newspaper to share their opinions.





# TURTLETOWN News



An endangered turtle swimming off the Turtletown coast

## DEVELOPING TOWN KILLS TURTLES

*Uncontrolled development along the Turtletown coast is killing the region's nesting population of sea turtles.*

The number of turtle nests in our area has dropped from 1,000 to just 200 in just two years, says Dr. Mark Powell, a marine biologist at Turtletown University. "This is caused largely by the bright lights from the new buildings along the coast. The lights make the turtles confused when they come ashore to try to lay their eggs, so they go back to sea again or don't build nests that are good enough to protect the eggs."

He says that there have also been cases of workers and machinery from the new development

straying into the nesting areas and accidentally destroying nests.

"Although the turtles are on the endangered list and protected by international law, very little is being done by the government to stop illegal beach development and protect the turtles' nesting area," says Dr. Powell.

Turtletown Mayor, Robyn Clark, disagrees with Dr. Powell's claims. "The turtles are one of the reasons tourists come here and we need more hotels to accommodate these visitors. It's not in our interest to

hurt the turtles. The hotels also mean more jobs for our local people. Environmentalists should not forget this," she said.

### Plastic waste also kills

But Dr. Powell also says that turtles are not just threatened by the development of the area alone. Around 30 dead turtles have washed ashore in the last three months. Autopsies on the animals conducted at Turtletown University have identified the plastic bags from the local supermarket found in their stomachs as the cause of death.

"Jellyfish is a main source of turtle food; they mistake the plastic bags for jellyfish when they see them floating in the water and eat them," explains Dr. Powell. "It is important that local people take responsibility for protecting these wonderful creatures and take care when disposing of their rubbish."



Can our area's turtles be saved?



# Lessons 4

## Everything Winds Up in the Sea

**Learning Outcomes:** Pupils use real-life skills to collect, sort and weigh plastic waste in a defined area. This activity meets maths and science programmes of study.

Even if you live in a landlocked state, your habits still have an effect on ocean life. This activity teaches pupils about human impact and what they can do to help out.

### What you need

- **Worksheet 4:** *Clean It Up!*
- Gloves

### What to do

- Begin by sharing with pupils the plastic facts in the box to the right. Also share that 80 percent of all ocean debris comes from the land – swept by wind or washed by rain off streets into drains, down streams and rivers, and out to sea. That means that no matter where you live, it's important to keep your community clean.
- As a class, select a nearby park, beach, or street to conduct your own clean-up. You might even decide to clean your own school grounds/playground.
- Before your clean-up, share the *Clean It Up!* Worksheet. Explain that pupils should record every item they collect, as well as its approximate weight. You may want to estimate the weight of some of the items in your classroom as practice.
- On the day of the clean-up, divide pupils into small groups. Appoint one member of each group to collect and record data. The rest should focus on picking up rubbish. Remind pupils not to pick up sharp objects or anything too heavy or dangerous.
- Do wear gloves, take drinking water with you, set a time limit, and bring along additional adults if possible. Remember to recycle as much rubbish as you can. Also encourage pupils to be respectful of the natural environment, such as plants and trees.

### Did You Know?

1. Plastic accounts for 90 percent of debris in the oceans.
2. A plastic bag can take between 400 to 1,000 years to break down in the environment.
3. Many marine animals mistake plastic for food and swallow it, with painful and often fatal consequences.
4. Plastic 'pellets' (the early form of plastic prior to use in manufacturing products) can contain toxins such as PCBs.
5. Plastic exists as tiny particles in every part of the oceans. In some areas there is six times more plastic than plankton.
6. Scientists believe that each year hundreds of thousands of seabirds and tens of thousands of marine mammals die after swallowing or being entangled in marine debris.
7. The mass manufacture of plastic products began over 50 years ago. Virtually every piece of the plastic produced since then is still in existence.
8. Scientists estimate 5 percent of all the world's plastic has entered the oceans.
9. More than 260 species of marine animals suffer from swallowing plastic.

**Top Left:** Old tyres, plastic bags, rubbish – what else lies on the ocean floor?

**Right:** Rubbish and debris cover the coastal area of Nouadhibou, Mauritania. Rusted tanker ships are visible in the background.



Did you know that almost 80 percent of debris found in the ocean comes from the land? Help reduce that percentage by cleaning up an area of your community.

PLASTIC		
Item Collected	Number Found	Approx. Weight

NON-PLASTIC		
Item Collected	Number Found	Approx. Weight

Total bags collected: \_\_\_\_\_ What was the most unusual item you found? \_\_\_\_\_





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## Dear Families,

*At school, your pupils have been learning about the wonders of marine wildlife and how human activities are impacting the ocean and the animals that live there. Scientists estimate that each year hundreds of thousands of seabirds and tens of thousands of marine mammals die after swallowing or being entangled in marine debris.*

*Nearly 90% of that debris is plastic. Plastic bags are among the most unnecessary disposable plastic products. Luckily they are also the easiest to avoid. You can help protect marine wildlife – pledge to bring your own reusable bag to shops!*

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## PROTECT MARINE WILDLIFE PLEDGE

*We, the \_\_\_\_\_ family want to help protect marine wildlife! We pledge to reduce, reuse, and recycle plastic bags.*

FAMILY MEMBER 1: \_\_\_\_\_

FAMILY MEMBER 2: \_\_\_\_\_

FAMILY MEMBER 3: \_\_\_\_\_

FAMILY MEMBER 4: \_\_\_\_\_

FAMILY MEMBER 5: \_\_\_\_\_

**Do your part to help marine wildlife! Take the pledge to reduce your family's use of plastic bags.**

# Beneath the Waves

Most of our planet isn't dry land; it's ocean. In fact, the ocean is so deep that huge mountains and deep valleys are hidden beneath its surface. Scientists believe it is the source of life on Earth and even of most of the oxygen in the atmosphere. Fresh water from rivers and streams drain to the ocean, which in turn, cycles fresh water back to the land in the form of rain. The ocean absorbs, stores, and moves vast amounts of heat, carbon, and water. This helps control our climate and weather.

The ocean is home to an incredible collection of plants and animals. The animals range from microscopic plankton to the world's largest creature – the blue whale.

There are nearly as many different species of fish in the seas as there are land animals and birds combined – about 14,000.

But the smallest creatures can be the most important. Phytoplankton are no more than the size of a pinhead, but they provide half the oxygen in the world.

Marine animals belong to three groups – drifters (*zooplankton*), bottom dwellers (*benthos*) and free swimmers (*nekton*). Drifters include jellyfish, while lobsters and starfish are among the bottom dwellers. The free swimmers range from eels and other fish to whales and dolphins.

All these animals are now at risk. Although the ocean has existed for billions of years, as we enter the 21st century, it faces its greatest threats,

including pollution, hunting, over-fishing and global warming. A recent study indicates that 40 per cent of the ocean is heavily impacted by human activities.

## Did you know?

- **BIG SPLASH:** Blue whales can grow to the size of a jumbo jet and weigh some 181 metric tons.
- **TINY FLIPPER:** The vaquita, a relative of the harbor porpoise found in Mexico's Sea of Cortez, is the smallest cetacean in the world – only 1.2m.
- **HEAR WHAT:** A whale's heart can be the size of a small car but its ear is smaller than a pea.
- **BIG MOUTH:** The tongue of a humpback whale is longer than a people carrier.
- **UNICORN COUSIN:** The narwhal, an unusual whale with a long spear-like tooth, is believed to be the source of the legendary unicorn.
- **DEEP DIVER:** A sperm whale can dive as deep as 3.2km in search of food.
- **SPEED RACER:** Fin whales are among the fastest cetaceans, reaching speeds of over 56km/hr.





A scientist works on the *Song of the Whale*.

## Giants of the Sea

Whales are intelligent, curious and gentle. They are the largest animals that have ever lived. They are also among the oldest of animals: their mammal ancestors left dry land to live in the sea more than 50 million years ago. Now they are fully adapted to life underwater. Whales are marine mammals known, along with

dolphins and porpoises, as cetaceans.

Like all mammals, whales give birth to live young. They breathe air. They have lungs, but cannot breathe through the mouth. They breathe through blowholes (nostrils) on the top of their heads.

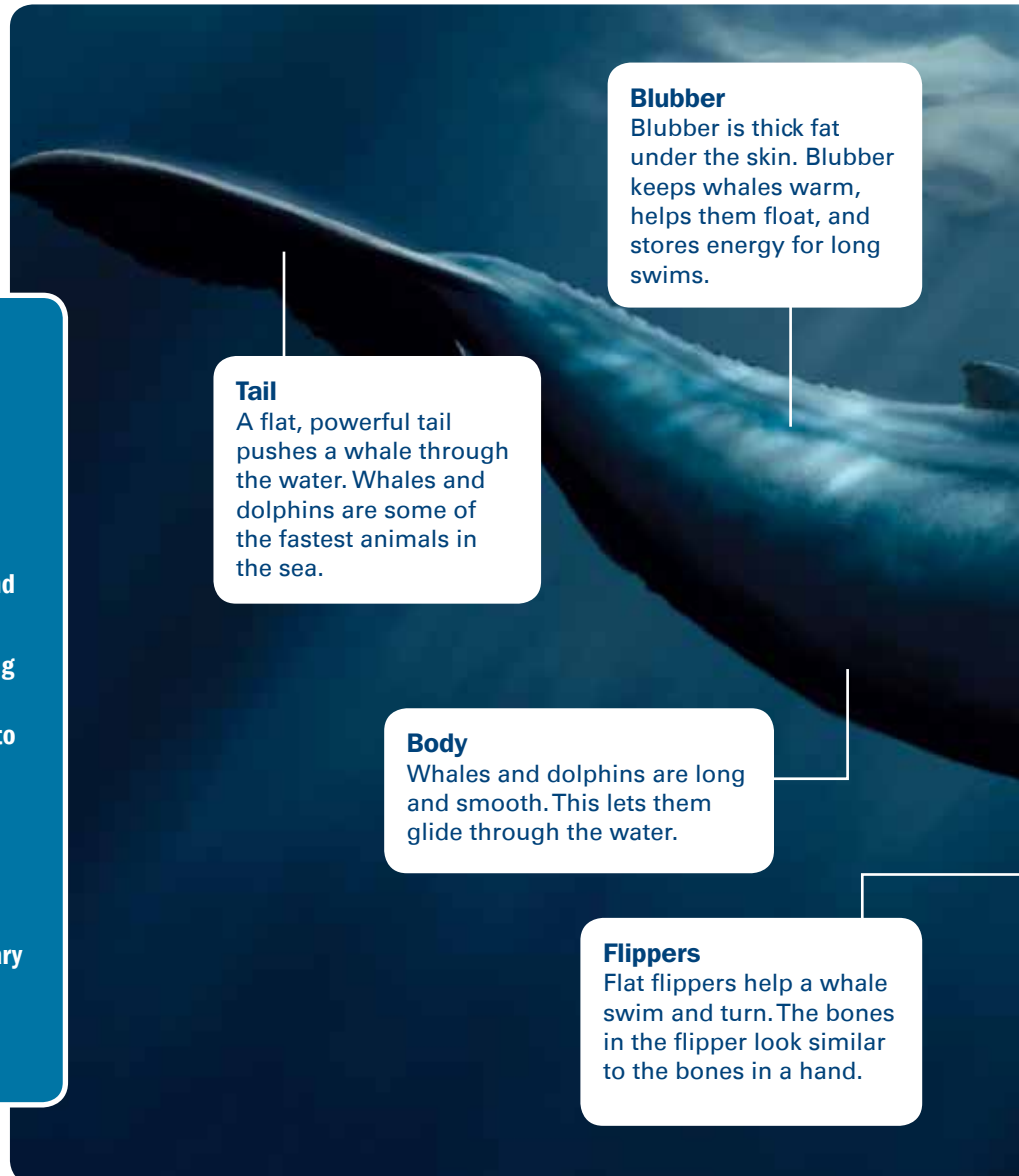
Some whales, such as orcas and sperm whales, have teeth; others filter their food using

## GOOD NOISE VS. BAD NOISE

Whales use sound in very different ways. Some whales produce songs that travel over vast distances. They also use echolocation, like bats, to locate food and find their way.

Scientists on IFAW's research vessel *Song of the Whale* have developed expertise in using underwater microphones to listen to and record the sounds that the animals make. This helps them to track, identify, and survey different species.

Too much ocean noise from human activities is a threat to whales and other marine animals. Undersea drilling, military activities, oil exploration and coastal construction can injure and even kill whales and dolphins.



### Blubber

Blubber is thick fat under the skin. Blubber keeps whales warm, helps them float, and stores energy for long swims.

### Tail

A flat, powerful tail pushes a whale through the water. Whales and dolphins are some of the fastest animals in the sea.

### Body

Whales and dolphins are long and smooth. This lets them glide through the water.

### Flippers

Flat flippers help a whale swim and turn. The bones in the flipper look similar to the bones in a hand.





baleen plates – huge fringed brushes that hang down inside the whale’s mouth to filter food from seawater. humpback, right and blue whales are all baleen whales.

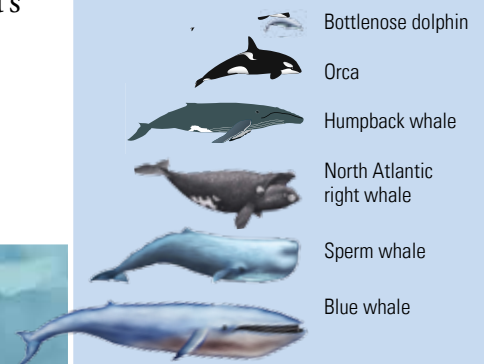
Many whales live, play, and hunt in groups. Humpback whales work in teams to catch food. Orcas hunt in packs to kill large prey. Whales also use sound and echoes to find their way in the dark underwater world.

Whales are found in every ocean and in five of the world’s largest rivers. Whales can migrate thousands of kilometres and dive to the depths of the ocean to feed.

## Threats to Whales

Today these gentle giants face more threats than ever before: pollution, a maze of fishing gear and shipping traffic, and whaling.

### Whales Come in Many Sizes



#### Blowhole

A whale’s nostrils are on top of its head, so it can breathe without lifting out of the water. The blowhole closes tight when the whale dives. Some whales can hold their breath for more than an hour!

#### Baleen

Baleen acts like a fine net that traps tiny sea animals.

#### Mouth

Humpback whales have huge mouths to take in enough food.

#### Throat

Humpback whales have folds in their throats. The folds can expand to take in big gulps of seawater.

## Human Impact

The health and future of the ocean and its animal life are tied to ours. The ocean's resources are plentiful. But they are not everlasting; humans need to take care of the ocean's resources. A recent scientific study determined that almost half of the world's ocean is affected by human activities.

## Pollution

Litter is a serious problem along shorelines, coastal waters, and beaches around the world. Known as marine debris, it is man-made, solid material that enters our waterways from dumping or by being washed out to sea by rivers and streams. Ranging from plastic bags and bottles to discarded fishing line, marine debris threatens sea life – and humans too.

Scientists believe that each year hundreds of thousands of seabirds and tens of thousands of marine mammals die after swallowing or getting tangled in marine debris.

More than 260 types of marine animals suffer from swallowing plastic, including loggerhead turtles and albatrosses. They mistake plastic bags for food. A whale that died in Cairns, Australia, was found to have 6m of plastic inside its stomach.

Over time, plastic breaks down into tiny bits floating in the water that all creatures in the sea can swallow – from tiny animals such as krill to the giant blue whale.

The worst areas of the oceans are described as 'plastic soup' because they are filled with tiny plastic pellets.

Most marine debris is rubbish discarded by people on land, then blown to the sea by wind or carried in rivers and sewers to the ocean.

Plastic accounts for nearly nine tenths of this rubbish. One big cause of this waste is plastic bags. Each year the world uses about 1.2 trillion plastic bags – 300 bags for every person in the world.

## Climate Change

Scientists warn there are serious risks to the oceans and marine life from global warming. Rising air and water temperatures will change ecosystems and destroy habitat. The results will be serious for both animals and people. Sea mammals already are feeling the heat. IFAW scientists have tracked the effects of global warming on southern right whales. Changes in water temperature led to changes in their food web and to lower birth rates.

In the Arctic, melting sea ice is really hurting marine animals. For 10 of the past 12 years, IFAW scientists have recorded below-average amounts of ice off Canada's east coast.



IFAW's Marine Mammal Rescue and Research Team works to save stranded and injured marine mammals. The team releases rescued animals back into the ocean. Between January and July 2012, the team saved 87 stranded dolphins along the shores of Cape Cod, Massachusetts, one of the worst stranding hot spots in the world.

© IFAW/M. Booth



Global warming is likely to blame. The floating ice patches provide nurseries and breeding grounds for harp seals. Because the newborn pups cannot swim, without ice to rest on, they cannot survive.

In 2010, estimates said that nearly all harp seal pups born that year in Canada died due to lack of ice. The melting ice is also a disaster for polar bears, the largest land predator in the world. Polar bears are considered marine mammals because they depend on the ocean. They get almost all their food from the ocean and even have tiny webs between their toes to help them swim.

Sadly, a recent study concluded that the loss of Arctic ice could drive polar bears to extinction within the next century.

They were recently listed as 'threatened' under the U.S. Endangered Species Act.

### Commercial Hunting

Commercial hunting, like whaling (see box at right), puts many marine animal species in danger. Many animal species face danger – and possible extinction – as a result of human activity. For example, thousands of seals are hunted each year in countries around the world.

The largest of these hunts takes place in Canada, where more than 1.6 million harp seals were killed in three years leading up to 2008.

The seals are either beaten to death with clubs called hakapiks or shot. Up to half of those that are shot in water are never recovered.



© IFAW

## WHALING IS STILL A THREAT

So many whales were killed by hunting, known as whaling, in past centuries that several species were nearly extinct.

Commercial whaling was banned worldwide in 1986. However, some countries, such as Japan, still kill hundreds of whales each year.

Most Japanese whaling takes place in the remote waters of the Southern ocean, which surrounds Antarctica. In 1994, the Southern ocean was declared a sanctuary for whales by the International Whaling Commission.

Other countries, such as Iceland and Norway, also continue to allow commercial whaling. Whalers from these countries hunt in the North Atlantic.

From the halls of government to the ice floes of Canada's Gulf of St. Lawrence and the Arctic, IFAW has worked for more than 40 years to protect harp seals and polar bears threatened by commercial hunting and climate change.





Scientists warn that there is a huge risk that the seal population will be depleted up to 70 percent over the next decade or so.

Canada's commercial hunt has been widely condemned internationally and even the majority of Canadians are opposed to it. In 2010, a new ban of the trade in commercial seal products went into effect in the European Union. In 2011 the import and export of harp seal skins was also banned in Russia.

### Even Sharks Need Saving!

The smallest shark is the cigar shark – tiny at 15cm.

The largest is the huge whale shark, which can grow to 15m long and is the largest fish in the sea.

Sharks are carnivores.

However, they most often eat fish, including other sharks.

People may fear getting bitten by a shark. But around the world there are fewer than 80 human attacks each year.

A shark has a boneless skeleton. Most sharks have a body shaped like a torpedo. This sleek shape helps the shark swim.

Inside a shark's mouth are several rows of teeth, which can be pointed, flat or razor sharp. In some sharks, new teeth grow in place of older ones every week.

A recent IFAW campaign resulted in China's largest shopping website, Taobao, banning the sale of all shark fin products, helping to protect some of the hundred million sharks killed for their fins each year.



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Whale sharks are huge but harmless to people. They eat only plankton and live in warm waters near the equator, migrating huge distances from the Indian Ocean to the Caribbean.

However, whale sharks are in danger from people. Whale sharks can't reproduce until they are 30 years old. So there is a big risk to their population if they are killed before having the chance to produce offspring.

India used to be one of the areas where whale sharks were most under threat from fishing. The law now protects whale sharks, making them the first fish to be protected in that country.

More than 100 million sharks are killed each year, many of them just for their fins to make the highly priced shark's fin soup. Many species of sharks are protected by governments but at least 73 shark species are threatened with extinction.

Many other marine animals are endangered, including sea turtles. Hawksbill sea turtles live in the Atlantic, Pacific, and Indian oceans. They are often killed because of the value of their shells for tourist trinkets. The eggs are also taken illegally from sea turtle nests on the beach.

Other marine animals are threatened by too much fishing or because they are caught in fishing nets.

## Glossary

**acoustic buoys:** a float attached to the seabed that makes a noise to warn ships of underwater hazards. Some are used to listen for and provide information on the location of whales.

**baleen plates:** huge, fringed brushes that hang down inside a whale's mouth and provide a way for baleen whales (which have no teeth) to filter food from seawater

**blowhole:** an opening for breathing on the top of the head of whales and dolphins

**cetaceans:** marine mammals that include whales, dolphins, and porpoises

**echolocation:** a way that dolphins use to locate objects in the ocean, by making high-pitched sounds and then interpreting their echos

**marine:** having to do with the sea

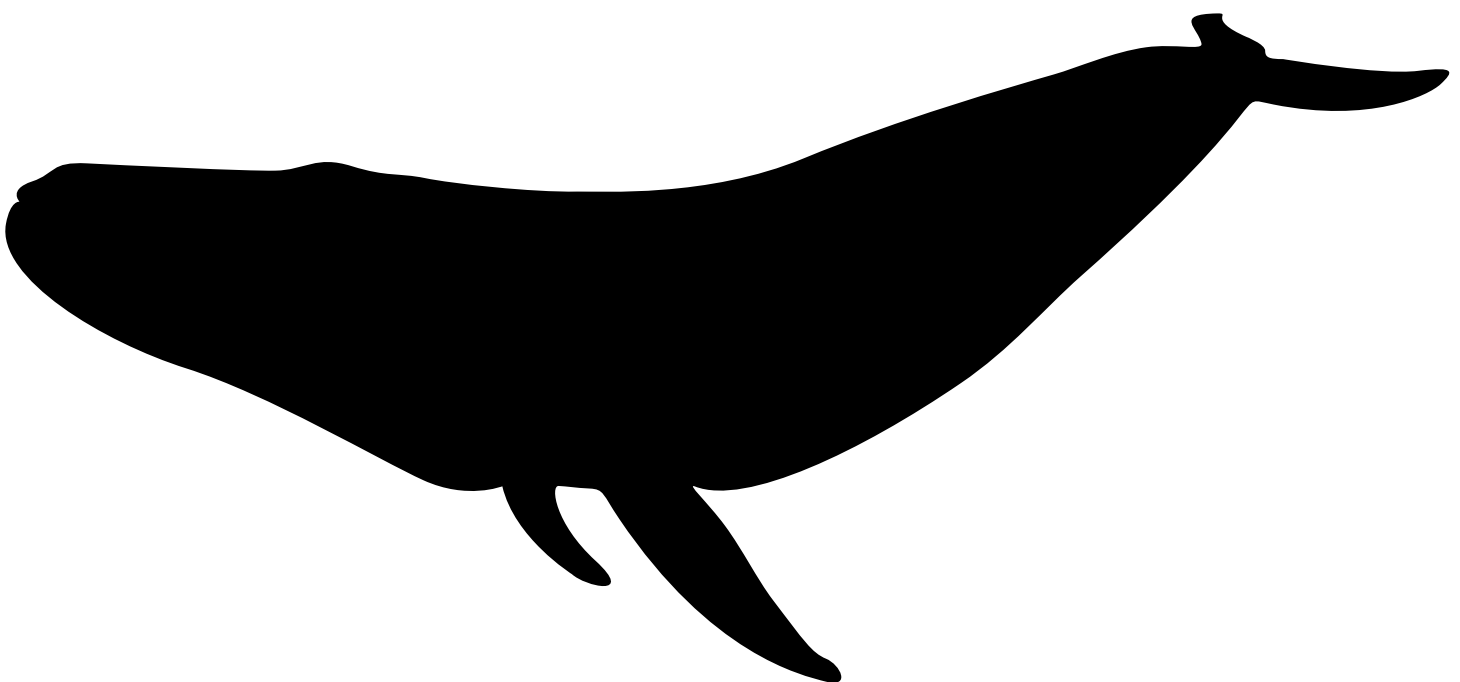
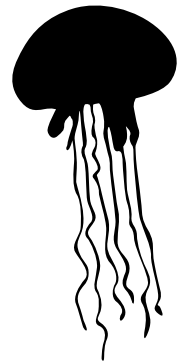
**marine debris:** ocean rubbish and pollution that threaten many species

**overfishing:** commercial or sport fishing that is so intense it reduces numbers of fish species too much

**plankton:** the tiniest marine life, individually no more than the size of a pinhead, but which as a group provide half the oxygen in the world

**sonar:** an underwater navigation system for ships that uses the echoes of sound waves.

**watershed:** an area of land that drains all its water into a lake, river, or ocean





**IFAW is an animal welfare and conservation charity that rescues and protects whales, dolphins, seals, turtles and other animals around the world. We are committed to ensuring these animals live free from human threats, including commercial hunting, pollution, and climate change. This image shows a sea turtle beneath the waves in the Galapagos.**

**Animal Action Education**