

The Great Pacific Garbage Patch

The Great Pacific Garbage Patch is an area in the ocean which contains a huge floating collection of plastic waste.

Size and Location

The Great Pacific Garbage Patch is located in the North Pacific Ocean. It is halfway between California, on the coast of the USA, and the island of Hawaii. According to some reports, it is thought to be around 1.6 million square kilometres in size. This is so big that it now covers an area of the ocean similar to six times the size of the United Kingdom.



The Great Pacific Garbage Patch is located between Hawaii and the west coast of the USA.

What is in the Great Pacific Garbage Patch?

Most of the plastic is not large items like bottles or crates. A large percentage of the debris is made up of **'microplastics'** – tiny particles that are smaller than 5 millimetres.

Most of these microplastics are the tiny pieces of larger items that have been worn down over time. This can be caused by the sun, the waves and even by sea creatures.

Items do not just stay floating on the surface. Different types of plastics can float just below the surface or sink lower down into the ocean. Larger objects include fishing ropes and nets that have been lost or dropped at sea.

Did You Know...?

The garbage patch is formed due to the **circulating** currents found in the oceans. Plastic waste that reaches these currents is trapped in a giant, slow-moving whirlpool.

The Clean-Up Operation

The largest attempt in history is now being made to understand and tackle the problem. Researchers have been counting, weighing and sorting every tiny item of plastic collected.

Larger objects are easier to remove from the ocean than the tiny microplastics. However, if these larger items are not removed, they may break down into smaller pieces.

Problems and Solutions

Plastic is cheap and fairly easy to make; however, it is very long-lasting. This means it can remain in the environment for hundreds of years, so every piece of plastic ever produced still exists today.

It is a danger to fish, birds and other sea life because creatures confuse tiny plastics for food. The tiny microplastics absorb **pollutants** which make them poisonous to marine life.

Some larger plastics can cause other types of injuries to creatures. The nets floating in the ocean are known to entangle marine life with no means of escape. Fish, sea turtles and dolphins are among the creatures most commonly in danger from these 'ghost nets'.



'Ghost nets' are found floating in the Great Pacific Garbage Patch.

Of course, the best solution of all is for us to try to reduce the amount of plastic entering the oceans in the first place. If we aim to create less waste – to reuse and recycle – then we can reduce the amount of new plastics adding to this and other garbage patches.

Glossary

circulating - Moving continuously around a space.

microplastics - Tiny pieces of plastic smaller than 5 millimetres.

pollutants - A harmful or poisonous material.

To find out more about ocean pollution, read the eBook 'A Place for Plastic' [here!](#)

Questions

1. Where is the Great Pacific Garbage Patch located? Tick **one**.

- California
- Hawaii
- North Pacific Ocean
- United Kingdom

2. What measurement must a fragment be less than, in order to be called a 'microplastic'?

3. Explain how 'garbage patches' are formed out at sea.

4. Fill in the missing word.

Researchers have been counting, weighing and _____ every tiny item of plastic collected.

5. What eventually happens to larger items of plastic if they are not removed?

6. Look at the section titled 'Problems and Solutions'. Find and copy a word which means 'very small'.

7. What does the author suggest is the **best solution** that we can all help with?

8. Which of the following sections tells you about how big the Great Pacific Garbage Patch has become? Tick **one**.

- Size and Location
- What is in The Great Pacific Garbage Patch?
- Did You Know...?
- The Clean-Up Operation

Answers

1. Where is the Great Pacific Garbage Patch located? Tick **one**.

- California
- Hawaii
- North Pacific Ocean**
- United Kingdom

2. What measurement must a fragment be less than, in order to be called a 'microplastic'?

5 millimetres

Explain how 'garbage patches' are formed out at sea.

Accept responses which refer to plastic entering the ocean water and either of the following:

- **being caught in circulating currents;**
- **getting trapped in slow-moving water like a whirlpool.**

3. Fill in the missing word.

Researchers have been counting, weighing and **sorting** every tiny item of plastic collected.

4. What eventually happens to larger items of plastic if they are not removed?

Accept either:

- **They may break down into smaller pieces (and become harder to remove).**
- **They can cause other types of injuries to creatures.**

5. Look at the section titled 'Problems and Solutions'. Find and copy a word which means 'very small'.

tiny

6. What does the author suggest is the **best solution** that we can all help with?

Accept any of the following:

- **to reduce the amount of plastic entering the ocean in the first place**
- **to create less waste**
- **to reuse and recycle**

7. Which of the following sections tells you about how big the Great Pacific Garbage Patch has become? Tick **one**.

- Size and Location**
- What is in The Great Pacific Garbage Patch?
- Did You Know...?
- The Clean-Up Operation

The Great Pacific Garbage Patch

The Great Pacific Garbage Patch is an area in the ocean which contains one of the world's largest floating collections of plastic waste. Sometimes known as a 'trash vortex', it is one of several similar collections of plastic waste to have formed out at sea.

Size and Location

The Great Pacific Garbage Patch is located in the North Pacific Ocean. It is halfway between California and the island of Hawaii. According to some reports, it is thought to be around 1.6 million square kilometres in size. This is so big that it now covers an area of the ocean similar to six times the size of the United Kingdom.



The Great Pacific Garbage Patch is located between Hawaii and the west coast of the USA.

What is in the Great Pacific Garbage Patch?

It's natural to imagine that the garbage patch would be made up of large plastic items, gathered together in a 'trash island'. In fact, a large percentage of the debris is made up of 'microplastics' – tiny particles that are defined as being smaller than 5 millimetres. The 'trash island' is therefore better described as more like a swirling 'soup' of tiny microplastics.

Most of these microplastics are the tiny pieces of larger items that have been

worn down over time. This can be caused by the sun, the waves and even by marine life.

Items do not just remain floating on the surface. Different plastics can float just below the surface or sink lower down into the ocean. Larger objects include fishing ropes and nets that have been lost or abandoned at sea.

How Was It Formed?

These 'garbage patches' end up being formed out at sea due to the currents found in the oceans. Plastic waste that reaches the ocean is carried out by the tide and, eventually, it reaches the **circulating** currents known as gyres, which are a bit like giant, slow-moving whirlpools. It can sometimes take years for the debris to complete the journey from the coast to the gyre. Once there, the rotation draws it in and traps any solid matter, meaning that it is unlikely to ever come out again unless removed by human **intervention**.

The Clean-Up Operation

The largest attempt in history is now being made to understand and tackle the problem. Researchers have been counting, weighing and sorting every tiny item of plastic collected.

Larger objects and fragments are easier to remove from the ocean than the tiny microplastics. However, if these larger items are not removed, they may break down to become small particles. These are then much harder to extract from the water. Some experts think that the problem has become so vast that it may be impossible to clean it up completely.



'Ghost nets' are found floating in the Great Pacific Garbage Patch.

Problems and Solutions

Plastic is cheap and relatively easy to make. However, it is extremely long-lasting as it is not **biodegradable**. This means it can remain in the environment for hundreds of years, so every piece of plastic ever produced is still in existence today.

Microplastics present a danger to fish, birds and other sea life because creatures confuse them for food. The tiny microplastics absorb **pollutants** which make them poisonous to marine life.

Some larger plastics can also cause injury to creatures. The nets floating in the ocean are known to entangle marine life with no means of escape. Fish, sea turtles and dolphins are among the creatures most commonly in danger from these 'ghost nets'.

Of course, the best solution of all is for us to try to reduce the amount of plastic entering the oceans in the first place. If we aim to create less waste – to reuse and recycle – then we can reduce the amount of new plastic adding to this and other garbage patches.

Glossary

biodegradable - Something which breaks down naturally over time.

circulating - Moving continuously around a space.

intervention - Help given to avoid a situation getting worse.

pollutants - A harmful or poisonous material.

To find out more about ocean pollution, read the eBook 'A Place for Plastic' [here!](#)

Questions

1. In which ocean is the Great Pacific Garbage Patch located?

2. What other name is the Great Pacific Garbage Patch known by? Tick **one**.

- rubbish pool
- trash vortex
- waste island
- trash island

3. Look at the section titled 'The Clean-Up Operation'. According to this section, what have researchers been doing as part of the process? Tick **two**.

- counting the items
- recycling the items
- weighing the items
- breaking down the items

4. What eventually happens to larger items of plastic if they are not removed?

5. What does 'biodegradable' mean?

6. Look at the section titled 'Problems and Solutions'. Find and copy a word which means 'very small'.

7. What does the author suggest is the best solution that we can all help with?

8. Name two different ways in which floating plastic could be a danger to animals or marine life.

1. _____

2. _____

9. Name an advantage and a disadvantage of using plastic as a material for making things, according to the article.

Advantage _____

Disadvantage _____

Answers

1. In which ocean is the Great Pacific Garbage Patch located?

North Pacific Ocean

2. What other name is the Great Pacific Garbage Patch known by? Tick **one**.

- rubbish pool
- trash vortex**
- waste island
- trash island

3. Look at the section titled 'The Clean-Up Operation'. According to this section, what have researchers been doing as part of the process? Tick **two**.

- counting the items**
- recycling the items
- weighing the items**
- breaking down the items

4. What eventually happens to larger items of plastic if they are not removed?

Accept either:

- **They may break down into smaller pieces (and become harder to remove).**
- **They can cause other types of injuries to creatures.**

5. What does 'biodegradable' mean?

Accept answers which show that the child has used the glossary, e.g. 'Something which breaks down naturally over time.'

6. Look at the section titled 'Problems and Solutions'. Find and copy a word which means 'very small'.

tiny

7. What does the author suggest is the best solution that we can all help with?

Accept any of the following:

- **to reduce the amount of plastic entering the ocean in the first place**
- **to create less waste**
- **to reuse and recycle**

8. Name two different ways in which floating plastic could be a danger to animals or marine life.
1. **Animals mistaking the plastic for food could be poisoned by pollutants.**
 2. **Animals could get trapped in or injured by larger items such as 'ghost nets'.**
9. Name an advantage and a disadvantage of using plastic as a material for making things, according to the article.

Accept responses which correctly categorise information from the text, such as:

Advantage **plastic is cheap / relatively easy to make / extremely long-lasting**

Disadvantage **not biodegradable / a danger to marine life / absorbs pollutants**

The Great Pacific Garbage Patch

The Great Pacific Garbage Patch is a sizeable area in the ocean which contains one of the world's largest floating collections of plastic waste. Otherwise known as a 'trash vortex', it is one of several similar collections of plastic waste to have formed out at sea.

Size and Location

The Great Pacific Garbage Patch is located in the North Pacific Ocean. It is halfway between California, on the coast of the USA, and the island of Hawaii. According to some reports, it is estimated to be around 1.6 million square kilometres in size. This is so big that it now covers an area of the ocean equivalent to around six times the size of the United Kingdom. However, the precise depth and size of the patch are constantly changing. Other garbage patches exist, for example in the Atlantic and Indian Oceans.



The Great Pacific Garbage Patch is located between Hawaii and the west coast of the USA.

What is in the Great Pacific Garbage Patch?

It's natural to imagine that the garbage patch would be made up of large plastic items, gathered together in a 'trash island'. In fact, the majority of the debris is made up of tiny particles called 'mesoplastics' (defined as being smaller than 5cm) and 'microplastics' (smaller than 5mm). The 'trash island' is therefore better described as more like a swirling 'soup' of tiny microplastics.

Most of these microplastics are the fragments of larger items that have been degraded over time but never fully decomposed. The effects of the sun, the waves and marine life all contribute to breaking down larger items into smaller microplastics.

Scientists have discovered plastics at every level of the ocean from the surface down to the seabed. Larger objects include: fishing ropes and nets that have been lost or discarded at sea; plastic water bottles; shopping crates and baskets; children's toys and even electronics such as games consoles!

How Was It Formed?

'Garbage patches' are formed out at sea due to circulating currents found in the oceans. Firstly, plastic waste that reaches the ocean is carried out by the tide. Eventually, it reaches circulating currents known as gyres, which are a bit like vast, slow-moving whirlpools. It can sometimes take years for the debris to complete the journey from the coast to the gyre. The rotation of the currents draws them in and traps any solid matter; once there, it is unlikely to ever come out again unless removed by human **intervention**.

Discovery

The man who is widely reported as first discovering the Great Pacific Garbage Patch is the **oceanographer** and boat captain, Charles J. Moore. He was travelling across the Pacific Ocean after completing a sailing boat race in 1997. He has since been a major part of the efforts to raise awareness and tackle the problem.

The Clean-Up Operation

The largest attempt in history is now being conducted to tackle the problem. Researchers have been meticulously counting, weighing and sorting every tiny item of plastic collected in order to gain a better understanding of where the various plastics originate from.

Larger objects and fragments are easier to remove from the ocean than the tiny microplastics. However, if these larger items are not removed, they may break down to become small particles, which are then much harder to extract from the water. Some experts think that the problem has become so vast that it may be impossible to clean it up completely.

Problems and Solutions

Plastic is cheap and relatively easy to make; however, it is extremely long-lasting as it is not **biodegradable**. This means it can remain in the environment for hundreds of years, so every piece of plastic ever produced is still in existence today.

It is a danger to fish, birds and other sea life because creatures confuse tiny plastics for food. The tiny microplastics absorb **pollutants** which make them poisonous to marine life. Researchers have found the existence of plastics at every stage of the food chain.

Some larger plastics can cause other types of injuries to creatures. The nets floating in the ocean are known to entangle marine life with no means of escape. Fish, sea turtles and dolphins are among the creatures most commonly in danger from these 'ghost nets'.

Of course, the best solution of all is for us to try to reduce the amount of plastic entering the oceans in the first place. If we aim to create less waste – to reuse and recycle – then we can reduce the amount of new plastic adding to this and other garbage patches.

Glossary

biodegradable - Something which breaks down naturally over time.

oceanographer - Someone who studies the ocean.

intervention - Help given to avoid a situation getting worse.

pollutants - A harmful or poisonous material.

To find out more about ocean pollution, read the eBook 'A Place for Plastic' [here!](#)

Questions

1. Which two locations is the Great Pacific Garbage Patch said to be located halfway between?
Tick **one**.

- California and USA
- Hawaii and United Kingdom
- California and Hawaii
- United Kingdom and USA

2. What estimate is given of the size of the Great Pacific Garbage Patch?

3. Why might the above estimate not be accurate?

4. Explain what is meant by microplastics and where they come from.

5. Look at the section titled 'How Was It Formed?'

The text says that the gyres 'are a bit like vast, slow-moving whirlpools'.

What makes this an effective description?

6. Look at the section titled 'The Clean-Up Operation'.

Find and copy two different words which mean 'take out'.

7. Which one of these definitions best describes the term 'ghost nets'? Tick **one**.

- an invisible fishing net
- a fishing net that is very old
- a fishing net lost or abandoned at sea
- a fishing net to catch ghosts

8. Explain two different ways in which the floating plastic can be a danger to animals or other marine life.

9. How do you think Charles J. Moore felt after he first encountered the Great Pacific Garbage Patch? Give evidence from the text to support your answer.

10. What do you think the purpose of this article is? Justify your answer with evidence from the text.

Answers

1. Which two locations is the Great Pacific Garbage Patch said to be located halfway between?
Tick **one**.

- California and USA
 Hawaii and United Kingdom
 California and Hawaii
 United Kingdom and USA

2. What estimate is given of the size of the Great Pacific Garbage Patch?

1.6 million square kilometres

(also accept 'six times the size of the United Kingdom')

3. Why might the above estimate not be accurate?

Accept answers which refer to the precise depth and size of the patch as constantly changing.

4. Explain what is meant by microplastics and where they come from.

Microplastics are defined as plastic pieces that are smaller than 5 millimetres in size. (Do not accept 5 centimetres.)

They are often fragments or remains from larger items that have been degraded over time.

5. Look at the section titled 'How Was It Formed?'

The text says that the gyres 'are a bit like vast, slow-moving whirlpools'.

What makes this an effective description?

Pupils' own responses such as:

- **it makes a comparison to something that can easily be pictured;**
- **a whirlpool moves round and round in a circular motion like the gyre;**
- **a whirlpool may be difficult to get out of, like it is difficult for the trapped plastic to escape from the gyre;**
- **the current moves around at a slow pace.**

6. Look at the section titled 'The Clean-Up Operation'.

Find and copy two different words which mean 'take out'.

remove

extract

7. Which one of these definitions best describes the term 'ghost nets'? Tick **one**.

- an invisible fishing net
- a fishing net that is very old
- a fishing net lost or abandoned at sea**
- a fishing net to catch ghosts

8. Explain two different ways in which the floating plastic can be a danger to animals or other marine life.

Pupils' own responses such as:

- **Creatures eating the plastic / mistaking it for food**
 - **Creatures being poisoned by plastic which has absorbed pollutants**
 - **Creatures becoming entangled in nets and unable to get out**
9. How do you think Charles J. Moore felt after he first encountered the Great Pacific Garbage Patch? Give evidence from the text to support your answer.

Pupils' own responses such as:

- **He would have been shocked / surprised because it had not been reported before (he is 'widely reported as first discovering' it).**
 - **He was saddened / appalled / disappointed and wanted to do something about it ('he has since been a major part of the efforts to raise awareness and tackle the problem').**
10. What do you think the purpose of this article is? Justify your answer with evidence from the text.

Pupils' own responses that are justified using evidence, such as:

- **To inform the reader (facts and explanations such as 'The Great Pacific Garbage Patch is a sizeable area in the ocean which contains one of the world's largest floating collections of plastic waste').**

- To inspire action by shocking the reader ('every piece of plastic ever produced is still in existence today' / 'it now covers an area of the ocean equivalent to around six times the size of the United Kingdom').
- To encourage action through explaining the 'Clean-Up Operation' and the best solution ('to try to reduce the amount of plastic entering the oceans in the first place').