

Subject links:
PSHE

Ages 11-16

Curriculum links:

Community and responsibility, policy, advocacy, persuasive writing

Ocean Literacy Principles:

6. The ocean and humans are inextricably interconnected

Learning Objectives:

- To explain why we need rules and regulations to protect the environment
- To understand how human development and activity leads to pollution in our oceans
- To explain why everyone is responsible for caring for the ocean
- To develop appropriate communication skills to influence policy and advocacy

Resources Provided:

- [PFAS introduction video](#)
- [PFAS Fact File](#)
- [Campaign letter template](#)
- [Social media template](#)

Forever chemicals

Sustainable Development Goals:



Step 1

Background

Harmful chemicals are polluting the planet, wildlife and impacting our ocean. PFAS, or 'forever chemicals,' are just one group of ocean poisons. But what are they and what can we do to stop them?

'Forever chemicals' have become part of modern manufacturing to the point that they're included as the default option and incorporated into our clothes, food packaging, cars and electronics, alongside the processes which produce them. These chemicals are persistent and continue building up in the environment, and they've been found in all water across the world, including rainwater and ocean spray. You can find more information in the [PFAS Fact File](#).

Step 2

Set the Scene

Start a discussion by asking what 'policy' means. A policy is a set of ideas or plans that is used as a basis for making decisions, especially in politics, economics or business (Collins Dictionary Online).

Now ask students what they think 'advocacy' means. Students may find this challenging, so they may need a few prompts to get started. In this case, advocacy is the attempt by individuals, like students and teachers, or groups, like the Marine Conservation Society, to influence decisions within the political world. The aim of this lesson is to collectively give the ocean a voice to bring about a policy change at a UK government level.

To set the scene, introduce the threats posed by 'forever chemicals' by watching our [PFAS introduction video](#).

Resources required: [PFAS introduction video](#)

Step 3

Activities

Activity 1: 10 minutes – PFAS Fact File

Read through the [fact file](#) highlighting key points from each section. This can be done individually or as a group or class activity. Some students may prefer to highlight different points to help them to categorise the information.

Activity 2: 20–30 minutes – Raising awareness

Students can work individually, in pairs, groups or as a class to collate information in the [fact file](#) and write a letter to their local politician or media outlet, like a newspaper or radio station, to raise awareness of the issue. Can you get your letter published to help spread the word? Use our [template](#) to get started and use [writetothem.com](#) or [theyworkforyou.com](#) to find your local representative and their contact details.

Resources required: [PFAS Fact File](#), [PFAS Campaign Letter template](#), [writetothem.com](#), [theyworkforyou.com](#)

Step 4

Extend

Does your school use products that contain PFAS chemicals? If so, what and where? Are there suitable alternatives? Could your school write this into their procurement policies? Have a group or class discussion about how your school could start to work towards this.

Resources needed: [Introductory video](#), [PFAS Fact File](#)

Step 5

Follow up

The only option to prevent forever chemical pollution in the environment is to stop them at source. We can't completely avoid forever chemicals in the products we purchase. Discerning which products contain forever chemicals and sourcing suitable alternatives would be incredibly difficult!

It's important to emphasise that solving this chemical crisis isn't on your students' shoulders – action must come from the top.

Through urgent and ambitious action, legislation can and will limit and regulate the use of chemicals to ultimately protect people and planet. The European Union has committed to phasing out all PFAS forever chemicals from all non-essential uses. The UK must align with this commitment, providing us with the same protection.

Take action

We urgently need to move towards a PFAS-free economy by stopping PFAS forever chemicals at source. We want to see all PFAS banned from all uses where there are alternatives, including things like firefighting foams and consumer uses.

We need your help to spread the word! Talk to your friends, family and other educators about forever chemicals.

Continue the learning

To learn more about other problems the ocean is facing, check out our [Threats to the ocean](#) lesson plan.

If your students are feeling disheartened or anxious about the marine pollution problem, explore our [Eco-Anxiety resources](#) activities promoting mindfulness.

PFAS Fact File

What are PFAS?

Harmful chemicals are polluting the planet, wildlife and people. PFAS, or per-fluoroalkyl and poly-fluoroalkyl substances, are just one group of ocean poisons. But what are they and what can we do to stop them?

Better known as 'forever chemicals', PFAS are a group of thousands of individual, but similar, chemicals. They're used in countless products and manufacturing processes. They have the following factors in common:

- Made up of a Carbon-Carbon backbone
- Strong, persistent Carbon-Fluorine bonds
- They don't react with air, water or grease, are flame retardant, and can withstand high temperatures
- Water soluble

How do they reach the sea?

Forever chemicals are now deeply embedded in modern manufacturing.

They're often used by default and can be found in everyday items like clothing, food packaging, vehicles, electronics and even in the industrial processes that produce them. Therefore, any waste or excessive runoff from these industries can enter our waterways and start the journey towards the ocean

Our water treatment systems currently don't remove PFAS from wastewater or sewage, and they've been found everywhere from the North to South Pole.



The problem

These chemicals are **persistent**. They have staying power, meaning that they don't ever disappear and build up in the environment over time.

Because they dissolve in water, they're **mobile**. This means they can travel easily through the environment, enter food chains and pass from animals to their young.

Their widespread use around the world, and their resistance to water, grease, heat and other chemicals, means they're becoming a **global problem**.

Forever chemicals have been found in **all water** across the world, including rainwater and ocean spray

PFAS Fact File



Impacts on marine life

There are now proven links between harmful chemicals and the health of animals. These include damage to their nervous systems, immunity and their ability to reproduce, alongside reducing their resilience to other stressors such as climate change and disease.

This is just the tip of the iceberg, with more studies on the long-term effects of chemical pollution published regularly. Research is showing the frightening real-world consequences of inaction on chemical pollution on our blue planet.

Known impacts of persistent chemicals

Early life
18-day old seal pups have already built up levels of pollutants that could reduce their ability to survive their first year at sea

Hormones and nervous systems
Forever chemicals impact polar bear behaviour and hormonal balance – from searching for food to mating

Everywhere and accumulating
80% of otters studied had at least 12 different types of synthetic PFAS chemicals in their livers

Immunity
The build up of harmful chemicals in harbour porpoise has increased their risk of infectious disease by 41%

Fertility
In two decades no new calves have been born to UK orcas – in the next century, a complete collapse is likely

Seals - MCS/Dave Boyle; Polar bears - Shutterstock/FloridaStock; Otter - Wildscreen Exchange/Ain Leach; Harbour porpoise - Ecomare / Soke de Wolf; Dorn Hoorn; Orca - Shutterstock/Christian Meunier

Interactive map

A [map](#) of UK PFAS pollution in wildlife was published by Watershed Investigations, the Marine Conservation Society and the Guardian, identifying official data on more than 1,000 animals to reveal widespread contamination. This illustrates the scale and severity of the problem, underscoring the desperate need for action.

PFAS Fact File



Take action

The only option to prevent forever chemical pollution in the environment is to stop them at source.

We can't completely avoid forever chemicals in the products we purchase. Discerning which products contain forever chemicals and sourcing suitable alternatives would be incredibly difficult.

Through urgent and ambitious action, legislation can and will limit and regulate the use of chemicals to ultimately protect people and planet. The European Union has committed to phasing out all PFAS forever chemicals from all non-essential uses. The UK must align with this commitment, providing us with the same protection.



Non-stick frying pan
© Pixabay



Chemical testing
© Julia Koblitz/Unsplash

We must act now

We urgently need to move towards a PFAS-free economy by stopping PFAS forever chemicals at source. We want to see all PFAS banned from all uses where there are alternatives, including things like firefighting foams and consumer uses.

Help us demand the changes that will stop forever chemicals reaching the sea.

- You could design a creative campaign to share what you've learned about forever chemicals – check out our [templates](#) for inspiration or write a persuasive letter to your local government representative!
- If you want to do more, we need your help to spread the word in your communities. Talk to your friends, family and colleagues about forever chemicals!

PFAS campaign letter

Name:

Write a letter to local media or your local government representative about forever chemicals. Can you get your letter published to raise awareness of the issue in your community? Use [writetothem.com](https://www.writetothem.com) or [theyworkforyou.com](https://www.theyworkforyou.com) to find your local politician

1. **Introduce** yourself and the issue. What's the headline statement that people should know?

2. **The problem.** What are the issues with PFAS or 'forever chemicals'? How do they affect the ocean and wildlife?

3. **Take action.** What can people do to help? What's at risk if we don't act now?

Top tips: Social media campaigns

Social media is a powerful tool for sharing information. To minimise possible risks to pupils, this activity uses the social media accounts of others, like family and friends.

Top tips for success

- 1. Decide on the channels you would like to use.** Would you like to create content for Facebook, Twitter, Instagram, TikTok?
- 2. Be clear about your campaign focus.** Can you describe in one sentence what exactly you want to achieve?
- 3. Agree the key messages** you would like to communicate. Can you sum up what you want people to know in three words or phrases?
- 4. Be clear about the Call to Action and hashtag.** What do you want people to do after they have seen your messages?
- 5. Decide your creative angle.** Successful social posts engage the audience. They can be funny, sad, emotional, thought provoking, relatable, informative or a combination of these qualities. Think about the best way to connect your audience with your key messages.
- 6. Follow your school's e-safety rules.** Remember never give pupils' names when their faces are visible. Talk about e-safety with pupils.
- 7. Use your pupils' strengths.** Musicians can make songs, natural performers can act, writers can focus on words, artists can make images, technical and organised pupils can act as producers and directors.
- 8. Reach out to the school community.** Are there any members of the community who work in advertising or marketing who could work with pupils on their campaigns?



Create a striking statement or picture. Grab people's attention so they're excited to read on and learn more



Spread the message!

Write and draw your message in the square below. Think about:

- What do you want people to know?
- What can people do?
- How can you grab people's attention?

A large, empty square with a thick purple border, intended for the user to write and draw their message.

Share the message

Take a photo of your picture and ask people you know with social media to post it on their accounts.



Spread the message!

Plan your video using the storyboard below. Think about:

- What do you want people to know?
- What can people do?
- How can you grab people's attention?

Storyboard for 60-second video

Picture in these boxes			
Description here			
Picture in these boxes			
Description here			