



Problem Pollutants

Key Stage/Age group KS2/3

Time needed for activity 15 – 20 minutes

Location Indoors or outdoors

Context

This activity plan focuses on common pollutants which affect water quality and as a result the biodiversity of waterbodies.

Natural Resources Wales’ purpose is to pursue sustainable management of natural resources in all of its work. This means looking after air, land, water, wildlife, plants and soil to improve Wales’ well-being, and provide a better future for everyone.

Curriculum links

	Geography	Science
KS2	<p>Understanding places, environments and processes</p> <ul style="list-style-type: none"> Identify and describe natural and human features Describe the causes and consequences of how places and environments change 	<p>Independence of Organisms</p> <ul style="list-style-type: none"> How human activity affects the global environment
KS3	<p>Understanding places, environments and processes</p> <ul style="list-style-type: none"> Describe and explain physical and human features Explain the causes and effects of physical and human processes and how the processes interrelate Explain how and why places and environments change and identify trends and future implications 	<p>Independence of Organisms</p> <ul style="list-style-type: none"> How and why food webs are affected by environmental factors

Objectives

By the end of this activity learners will be able to:

- Name and recognise common pollutants.
- Suggest how common pollutants enter waterbodies.
- Understand the negative effects pollutants can have on waterbodies.
- Discuss and suggest which of the problem pollutants cause the worst problems.



Equipment and resources

- **Six plastic bottles filled with the following:**
 - Cattle slurry - Milk or water mixed with yoghurt, green food colouring or gravy browning/granuals to achieve a green/brown colour
 - Silage effluent - Water with grass, black ink or paint
 - Untreated kitchen waste - Water mixed with olive/rapeseed oil with vegetable/fruit peelings
 - Unpasteurised milk - milk
 - Untreated raw sewage - Apple juice mixed with chunks of dog/cat food or brown clay
 - Brewers grain effluent - Shandy or apple juice (with bits) or cloudy lemonade
- **Resource cards - Problem pollutants**

What to do

- 1 Give some background to your learners about the effects problem pollutants have on our waterbodies, play our 'Problem Pollutants - Glossary Game' or read our 'What is water quality' Information note.
- 2 You can either make the sample bottles beforehand or give each group an empty bottle and a pollutant sample to prepare.
- 3 You can either:
 - (a) Present one bottle at a time to your group and question them about the bottles' possible contents. Use the resource cards to label what pollutant each bottle represents (you don't have to tell them they are fake!).
 - (b) Split your learners into smaller groups and give each group a pollutant bottle or a set of pollutants to label using the resource cards provided.
- 4 Can they group the sources of pollution into industrial, agricultural and domestic?
- 5 Next split your learners into smaller groups and ask each group to discuss which of the pollutants they think would cause the most damage to the environment if they were to enter a waterbody.
- 6 After each group has had an opportunity to discuss, ask them to share their thoughts with the wider group. You may wish to record the responses to see which group is the closest to being correct.
- 7 Share the results with the group, 1 being the worst pollutant and 6 being the least harmful to the environment.
 - 6 - Untreated domestic sewage
 - 5 - Untreated kitchen waste
 - 4 - Cattle slurry
 - 3 - Brewers grain effluent
 - 2 - Silage effluent
 - 1 - Unpasteurised milk
- 8 Depending on the group's age and ability, discuss how pollution incidents happen and ways they could be avoided.

Suggested key questions

- **What is silage effluent/slurry/raw sewage/brewers grain effluent?**
- **How do these pollutants get into waterbodies?**
- **What can humans do to reduce the amount of pollutants reaching waterbodies and impacting on the environment?**



Adapting for different needs/abilities

Less able

- Instead of using the full set of problem pollutants pick out the ones you feel are appropriate to your learners' level of understanding.

More able

- Discuss the reasons why these substances are harmful to the environment and how they enter waterbodies. See further information.

Follow up activity/extension

- Water quality - Information note
- Create a food chain to demonstrate the effects of problem pollutants on the biodiversity within a waterbody.

Additional information

Useful websites:

A case study of an incident – Milk tanker

<http://news.bbc.co.uk/1/hi/england/2149856.stm>

Young people's Trust for the Environment

<https://ypte.org.uk/factsheets/river-pollution/polluting-the-rivers>

Looking for more learning resources, information and data?

Please contact: education@naturalresourceswales.gov.uk or go to <https://naturalresources.wales/learning>

Alternative format; large print or another language, please contact:
enquiries@naturalresourceswales.gov.uk
0300 065 3000