60 mins



# Water Quality Detectives

**Equipment required**

- Print out the 'Water Quality Detectives' worksheet, one per pair
- Pencils or pens
- Internet enabled devices and internet access

**To complete the activity**

1. Begin by asking learners:
   - "What do we mean by water quality?"
   - "Why is water quality important for people, animals, and plants?"

2. Share the Dŵr Cymru video 'How we clean your waste water' – www.tiramor.cymru/waterquality (Resource 1). After watching, consider:
   - What makes water safe to drink?
   - What factors could affect water quality before it reaches this stage?

3. In pairs, ask learners to consider:
   - Characteristics of good quality water (e.g. clear, safe to drink).
   - Signs of poor quality water (e.g. cloudy, bad smell, harmful substances).

4. Challenge pairs to list as many factors as they can that affect water quality. Encourage them to think about both natural factors (e.g., sediment runoff, algae growth) and human activities (e.g. pollution, industrial waste).

5. Provide each pair with a copy of the 'Water Quality Detectives' worksheet.

6. Encourage learners to use the internet to research factors that can impact water quality.

7. Support learners to create a mind map titled "How We Can Improve Water Quality." Guide learners to start with "Improve Water Quality" in the centre of the mind map. Next, ask learners to add branches for different areas where action can be taken, such as:
   - At Home (e.g. reducing water waste, avoiding harmful chemicals).
   - In the Community (e.g. organising clean-up events, raising awareness).
   - In Nature (e.g. planting trees near water sources, protecting wetlands).
   - In Industry (e.g. improving waste disposal practices, adopting water-saving technologies).

8. For each branch, encourage learners to add specifications to improve water quality.

9. As a closing task, ask learners to reflect on what they've learnt by writing or sharing one action they can take to improve water quality and why it is important.

## Answer Key

# Water Quality Detectives

| FACTOR | IMPACT ON WATER QUALITY | POSSIBLE SOLUTION |
|---|---|---|
| **Sediment from soil erosion** | Makes water cloudy, reducing sunlight for aquatic plants and clogging fish gills. | Plant trees or use barriers to prevent soil erosion near water bodies. |
| **Fertilisers from farms** | Causes nutrient overload in water, leading to algae blooms (eutrophication) that deplete oxygen for aquatic life. | Use organic fertilisers and create buffer zones with vegetation near water sources. |
| **Industrial waste** | Releases harmful chemicals into water, poisoning aquatic ecosystems and making water unsafe for drinking. | Reduce nutrient pollution (fertilisers) and monitor water quality regularly. |
| **Oil spills** | Coats the surface of water, blocking oxygen exchange and harming birds, fish, and marine life. | Use booms and skimmers to clean spills, and improve safety measures for oil transport. |
| **Plastic litter** | Pollutes water, harming animals that ingest it or get entangled, and leaches microplastics into ecosystems. | Ban single-use plastics and organise community clean-ups near water bodies. |
| **Sewage discharge** | Adds harmful bacteria and pathogens to water, making it unsafe for human and animal use. | Improve wastewater treatment works and avoid dumping untreated sewage into water. |
| **Stormwater runoff** | Washes pollutants like oil, chemicals, and rubbish from roads into water sources. | Build permeable pavements and stormwater management systems, such as rain gardens. |

# Water Quality Detectives

What impact can the following factors have on water quality?

| Factor | Impact on water quality |
| --- | --- |
| Sediment from soil erosion | |
| Fertilisers from farms | |
| Industrial waste | |
| Algae growth | |
| Oil spills | |
| Plastic litter | |
| Sewage discharge | |
| Stormwater runoff | |

**TASK!**

Create a mind map titled
**"How We Can Improve Water Quality."**

Start with "Improve Water Quality" in the centre of your mind map, then add branches for different areas where action can be taken (e.g. "At Home," "In the Community," "In Nature," and "In Industry"). For each branch, add specific actions to improve water quality.
Use the internet to research creative and practical solutions.

## Reflect

Which action do you think is the easiest to do? Why?

Which action would have the biggest impact on improving water quality?

What action can you take to improve water quality? Why is this important?

Over 80% of Wales' waters are classed as good or high quality, helping protect local wildlife.