**ACTIVITY: Nutrient pollution**

**Activity idea**

In these activities, students are helped to understand how nutrients are washed off the land and into water systems. They also investigate the effects of nutrients in aquatic ecosystems.

By the end of these activities, students should be able to:

* explain how pollutants are dissolved and/or carried into groundwater and surface water
* discuss how polluted groundwater may lead to polluted lakes or rivers
* explain some of the possible impacts on water ecosystems of agricultural nutrient run-off and leaching.

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**Introduction/background**

Farming has been linked to declining water quality in some areas of the country. Rainwater or irrigation can pick up nutrients such as nitrogen and phosphorus. These nutrients may then be leached into groundwater or washed off farms into waterways – streams, rivers, lakes and estuaries. Nutrients in water systems can result in reduced water quality and eutrophication. These two activities help students to understand how pollution gets into water and the effects of nutrient pollution in water systems.

**What you need**

* Access to the student activities [Groundwater contamination](https://www.sciencelearn.org.nz/resources/1255-groundwater-contamination) and [Nutrient impact experiment](https://www.sciencelearn.org.nz/resources/155-nutrient-impact-experiment)
* Access to the articles [Managing nutrients](https://www.sciencelearn.org.nz/resources/928-managing-nutrients), [Farming and environmental pollution](https://www.sciencelearn.org.nz/resources/920-farming-and-environmental-pollution), [Farming development and changing landscapes](https://www.sciencelearn.org.nz/resources/963-farming-development-and-changing-landscapes), [Farm management practices](https://www.sciencelearn.org.nz/resources/969-farm-management-practices)
* Access to the video clips [Nutrient leaching](https://www.sciencelearn.org.nz/videos/517-nutrient-leaching) and [Managing the nutrient problem](https://www.sciencelearn.org.nz/videos/49-managing-the-nutrient-problem).

**What to do**

1. In small groups or as a class, read the articles [Managing nutrients](https://www.sciencelearn.org.nz/resources/928-managing-nutrients), [Farming and environmental pollution](https://www.sciencelearn.org.nz/resources/920-farming-and-environmental-pollution), [Farming development and changing landscapes](https://www.sciencelearn.org.nz/resources/963-farming-development-and-changing-landscapes), [Farm management practices](https://www.sciencelearn.org.nz/resources/969-farm-management-practices) and watch the video clips [Nutrient leaching](https://www.sciencelearn.org.nz/videos/517-nutrient-leaching) and [Managing the nutrient problem](https://www.sciencelearn.org.nz/videos/49-managing-the-nutrient-problem) .
2. In the first activity – [Groundwater contamination](https://www.sciencelearn.org.nz/resources/1255-groundwater-contamination) – students build an aquifer model to investigate nutrient pollution. It helps students visualise how water carries pollutants into ground and surface water. The activity explores point source and non-point source pollution. Non-point sources of pollution do not enter groundwater at any one particular spot. Examples of non-point sources of pollution are fertilisers, pesticides and acid precipitation. Point sources of pollution are directly identifiable sources of contamination, such as landfills, leaking chemical storage tanks or spills. Farming may relate more to non-point source pollution (but not always), and you may wish to just do that part of the experiment.

3. In the second activity – [Nutrient impact experiment](https://www.sciencelearn.org.nz/resources/155-nutrient-impact-experiment) – students use plastic bottles to simulate links between the land and water ecosystems. Students investigate some of the potential impacts increased nutrient use on land can have on aquatic environments. They will see the effects of eutrophication – the excessive growth of aquatic plants in the presence of nutrients.