# Separating the Water from the Waste

#### In-class activity – Year 7

Activity overview

In this activity, students will investigate the sewage treatment processes and separation techniques used.

## Curriculum links

**Year 7 – Science**

* Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques (ACSSU113)

## Time required

1 hour.

## Things you will need

* Watch the Unitywater video: [The sewage treatment plant](http://www.Unitywater.com/sewagetreatment)
* Samples of fake sewage water for groups. To make fake sewage mix the following items in containers with tap water: detergent, cotton bud, cooking oil, apple or orange peel, leaves, dirt, wet wipe.
* ‘Separating the water from the waste’ activity sheet (Activity sheet included below.)
* Separation equipment (one set per group): sieve, filter paper, sand, beakers, funnel.

## Activity outline

* Watch the Unitywater video: [The sewage treatment plant](http://www.Unitywater.com/sewagetreatment)
* Ask students to note while watching the following:
	+ Key stages of the sewage treatment process
	+ Components of sewage and different techniques used to remove them
	+ Why sewage treatment is important.
* Discuss the topics above.
* Break the class into groups. Present each group with a container of fictional sewage, separation equipment and ‘Separating the water from the waste’ activity sheets.
* Explain to the students that they must plan a method to separate a number of known ‘contaminants’ from the ‘sewage’ to produce ‘treated effluent’ that would be safe to release into a local waterway. Explain that the samples are not real sewage, but have been made using household ingredients; however, correct scientific procedures should be followed such as no tasting.
* Students plan their activity using the activity sheet to identify separation techniques they will use for the various contaminants.
* Review the planned separation methods with groups and suggest modifications where necessary.
* Students conduct the activity following their plan.
* Discuss the results and methodologies. Review separation techniques used, separation techniques that are similar to stages in the real sewage treatment process, and stages from the sewage treatment process that were not used in the activity.
* Discuss with the students why it is important that sewage undergoes treatment before being released into the environment.





## Activity sheet

### Separating the water from the waste

*\* This activity uses dirty water samples that have been made using common household ingredients. Safe scientific procedures should be followed including no tasting of the samples.*

**Your task:** Outline a procedure you would follow to separate the contaminants from the water. Make sure you indicate what separation techniques you would use and equipment needed.

**Planning:**

|  |  |  |
| --- | --- | --- |
| **Contaminant** | **Separation technique** | **Equipment required** |
|  |  |  |
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|  |  |  |
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**Aim:** To separate a number of known ‘contaminants’ from ‘sewage’ to produce ‘treated effluent’ that would be safe to release into a local waterway.

**Equipment:**

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**Procedure:**

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**Results:**

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| **Sample before separation** | **Sample after separation** |
|  |  |

**Conclusion:**

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