# *Resource 2 – Sedimentation and filtration*[1]

In this activity you will explore the physical processes used in the primary treatment of sewage.

## What you will need

- A mixture of dirt, sand, small and large stones and some cut up paper and cardboard, and oil are mixed into a bucket of water to simulate the solid-liquid mix of sewage.
- Strainers.
- A number of 500 mL beakers or jars.
- Plastic tubing.
- Funnels.
- One square metre of chicken wire.
- Buckets.

## Background

Sewage treatment plants are all about using science techniques and knowledge to treat sewage to make it safe, while at the same time retrieving the useful resources, especially water, that make up sewage.

In this activity you are investigating three physical processes used in the primary treatment of sewage:

- sedimentation – small particles are allowed to settle in the water
- decanting – clear liquid is poured off the top as the material settles to the bottom
- filtering – large particles are captured by straining through wire mesh.

## What to do

1. Your task is to devise a system whereby you separate (as much as possible) all of the different ingredients in this mixture and obtain the cleanest water possible.
2. You can only use the materials provided.
3. You cannot remove items with your hands, although you can physically move the 'sewage' mixture from one container to another.

[1] This activity could be done as a class activity or as a demonstration.

4. It is as much a 'thinking' exercise as an experiment, so brainstorm with your partners about how you are going to achieve the goal before launching into the activity.

## Questions

1. Complete the table below to record your experiences.
2. Draw a flow chart showing the different steps in your separation system. Label the different processes you used at each stage.
3. How well were you able to separate the different ingredients?
4. What other methods could you use to further improve the quality of the water?

| **Ingredient** | **How we separated it from the other ingredients** |
|---|---|
| Paper and cardboard | |
| Sand | |
| Small stones | |
| Large stones | |
| Dirt | |
| Oil | |
| Water | All the above |