# Biogas plant instructions (teacher)

A biogas plant is a factory where waste organic matter (feedstock) is broken down by bacteria to generate biogas, which can be used as a fuel source. Facilitate the pupils’ work to build their own biogas plant using the equipment listed, and the instructions provided.

## Equipment

* Kitchen scales, and measuring jug or measuring cups
* 2 large mixing bowls
* Hand blender
* 960g of feedstock 1 (onions)
* 960g of feedstock 2

Feedstock can be prepared up to a day in advance of the lesson and stored in a fridge.

## Pre-activity teacher preparation

## Method for preparing the feedstock pastes

1. Weigh 960g of feedstock 1 into a bowl.
2. Add 960ml of tap water.
3. Use the hand blender to blend this into a paste.
4. Set the bowl of paste aside. This will be used by the pupils as the feedstock for their ‘control’ biogas plant.
5. Rinse the hand blender to remove any remaining feedstock 1 paste.
6. Weigh 960g of feedstock 2 paste into the second bowl.
7. Add 960ml of tap water into the second bowl.
8. Use the hand blender to blend this into a paste.
9. Set the bowl of paste aside. This will be used by pupils as the feedstock for their ‘test’ biogas plant.

**Tips for preparation before the lesson, and experimental setup of biogas plants:**

1. 500ml plastic bottles with narrow necks (such as most fizzy drinks bottles) work well in this activity.
2. Use high quality helium grade balloons for the biogas plants to minimise unwanted escape of gas during the experiment (as latex balloons are porous). 27.5cm (11”) amscan® helium quality latex balloons were used in the development of this activity.
3. Balloons should be able to be stretched over the neck of the bottle to cover the neck of the bottle, while allowing the remainder of neck of the balloon to remain approximately over the centre of the neck of the bottle. This helps to minimise escape of gas due to overstretching of the balloon, and allow gas to flow freely into the balloon. Pupils should ensure that the necks of the balloons are well sealed to the bottle with duct tape, without damaging the balloon.
4. Removing the plastic rings from the necks of the plastic bottles that pupils use in the biogas activity makes it easier for pupils to attach balloons to the neck of the bottles without tearing them, and can help improve the seal when duct tape is used to seal the balloon to the bottle. These plastic rings can be removed prior to the lesson.