

Waste disposal

Avoid waste	<p>If you carry out a practical activity in a school or college you may end up with waste. Waste is anything you don't want. The best way of dealing with waste is not to create it in the first place. Take care not to contaminate a large stock bottle, for example, by putting a dirty spatula or teat pipette into it.</p> <p>Plan the activity so as to minimise the amount of waste you need to deal with. If there are two alternative methods, which one generates the least waste? Microscale chemistry uses much smaller quantities than traditional methods, so generates much less waste.</p>
Waste disposal in general	Waste disposal is tightly, and expensively, regulated. Legislation distinguishes between many different categories of waste. This sheet refers mainly to the waste that might be generated in student practical work.
Recycle or re-use	Before disposing of waste, consider whether it can be recycled or re-used. Can the product you have made in this chemical reaction, eg copper sulfate, be used for some further purpose? Can an impure solvent be safely re-distilled to purify it?
Solids, including solid non-hazardous chemicals	Solids which are not hazardous and not separately classified, including non-hazardous solid chemicals, eg calcium carbonate, can be placed in the solid non-recycling waste. You have a duty of care to those handling the waste later on. For example, broken glass (if there is no separate glass collection) should be wrapped and labelled to minimise the risk of injury.
Water-soluble chemicals	<p>If a chemical dissolves in water and is not classed as hazardous, eg sodium chloride, it can be dissolved in water and poured down the drain as effluent. Small amounts of some hazardous chemicals can be disposed of in the same way, providing the concentration is below a threshold – the limit depends on the nature of the hazard.</p> <p>For some chemicals, eg copper sulfate, a 10% solution is acceptable (ie not more than 10 g of the chemical in 100 cm³ of the solution). For other chemicals, eg potassium dichromate, the maximum concentration is 0.1%. For some, eg mercury compounds, this method of disposal is completely prohibited. It is prudent to react acids or alkalis so that the effluent is roughly neutral. Similarly, react oxidising agents with reducing agents before them flushing away.</p>
Hazardous solid chemicals	Hazardous chemicals which do not dissolve in water, eg lead oxide, or which do dissolve but are too hazardous to dispose of in this way, eg many pesticides, must be collected by a Licensed Waste Carrier for safe processing.
Non-aqueous liquid chemicals	Chemicals that are liquids that do not mix with water, eg paraffin or solvents for cleaning paint brushes, must be collected by a Licensed Waste Carrier for safe processing. Cooking oil, even although it is not regarded as hazardous, must not go down the drain because it can result in blockages in the sewers (fatbergs).
Biological waste	Much biological waste (ie plant materials) can be treated as solid waste, although ideally it should be composted. Left overs from dissections must NOT enter the food waste system. It should be wrapped in newspaper and placed in the main non-recyclable waste.
Microbiological waste	Microbiological waste needs to be steam sterilised with a pressure vessel (autoclave or pressure cooker) before disposal.
Gases	Discharging gases to the atmosphere is regarded as pollution. However, small amounts of most gases can be discharged from fume cupboards to the atmosphere. Ensure that the quantities released would not be a risk or a nuisance (eg causing an unpleasant smell) to neighbours.
Cells and batteries	Discharged cells and batteries of all types must not be disposed of as solid waste. Collection points can be found at civic amenity sites and at shops selling batteries. Many cells and batteries have the 'do not discard' symbol (right).
Waste electrical and electronic equipment	No electrical and electronic equipment - from vacuum cleaners to light bulbs, from mobile phones to ammeters - can be disposed of as solid waste. These must be collected separately, either by licensed waste carriers (for businesses, including schools) or taken to a civic amenity site (usually only domestic users). Modern items should have the 'do not discard' symbol (right).
Radioactive substances	Some low-level radioactive materials can be disposed of as solid waste or effluent, as above. However, legislation is very detailed and a licensed waste carrier is usually needed.

