# Teacher notes Reduce, reuse, repair, recycle

‘Reduce, reuse, repair, recycle’ is a hierarchy that we use to save energy in production of new items. It is a hierarchy because the options should be considered in this order. Reducing use will ultimately save the most energy, with recycling being considered as an option when we cannot reduce, reuse, or repair an item.

## Reduce means to try and decrease the amount of items that we use, preventing them being produced in the first place, for example, buying only the food you will eat, to reduce food waste.

**Reuse** encourages us to use items multiple times until they break, to prolong their lifetime of use and delay them going to landfill, for example, using a reusable bag to do your shopping.

**Repair** is when we fix broken items to continue using them, rather than throwing them away, for example, sewing buttons back on to a coat so that you don’t need to buy a new one.

**Recycle** means that if we are throwing out items like plastic bottles, these items don’t end up in landfill, but are used to make a new product. Unfortunately, most plastics lose quality when they are recycled and can only be recycled once or twice before eventually going to landfill.

## Biomimicry

Scientists, inventors and engineers regularly take inspiration from nature when coming up with new products. The eco-friendly water bottle uses alginate, from brown seaweed. The gel bubble that holds the water needs to display several of the properties of the seaweed, in that it should be strong, flexible, hold water, and be able to be eaten or biodegrade under the right conditions.

This is an example of biomimicry, where nature has inspired a new invention. More examples can be found on the biomimicry cards and at [www.biomimicry.org](http://www.biomimicry.org).

## Eco-friendly water bottle

The bubbles are created using a process called spherification. Spherification is used by chefs to make tea bubbles and imitation caviar.

While the chemicals we have provided are food grade, we do not recommend eating the water bottles you make in class, as we cannot guarantee that the storage or packaging of the chemicals after they leave the supplier will meet food grade standards.

Find out more about the edible water bottle at: [www.skippingrockslab.com/ooho!.html](http://www.skippingrockslab.com/ooho!.html)

## Material Safety Data Sheets

You have been provided with two MSDS documents for the chemicals (sodium alginate and calcium lactate) provided for use in this activity. These documents give more information on these chemicals, including any safety equipment recommended and how the chemicals should be disposed of. These documents should be referred to if you are conducting a risk assessment or COSHH (Control of Substances Hazardous to Health) assessment of this activity.