

With special thanks to the Salters' Institute for funding this publication.

## About this activity

In this activity you will carefully observe what happens when samples of home-use plastics are placed in water and when a force is applied to create a crease.

Just like scientists in industry, you will identify and name plastics based on how they behave in different conditions (what a place is like to be in).

## Kit List

- ☑ 4 **plastic samples** (examples below) cut to approximately 8cm by 1cm and numbered 1 to 4 with a permanent marker
- ☑ 1 litre container
- ☑ ½ litre of water

**Time: 30 Minutes**

## Gathering your samples:

You will need to cut your **plastic samples** from the plastic items pictured. Ask an adult to help you.



**Sample 1**  
Used for shower gel bottles.



**Sample 2**  
Clear packaging used for greeting card multi-packs or gift sets.



**Sample 3**  
White foam container used for takeaway food



**Sample 4**  
Clear pop bottle

## Watch out!



- Take extra care during the 'crease test' as small pieces may splinter off the plastic when under stress. You could use safety glasses if you have them or sunglasses to protect your eyes.
- Gloves are optional but could prevent cuts from sharp edges.
- Dispose of the pieces of plastic by recycling them if possible (do not pour down the sink).

# Which Plastic?

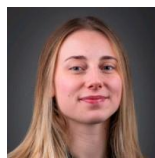
## Important words to understand:



- |                      |                  |
|----------------------|------------------|
| • fair test          | • landfill       |
| • plastic            | • non-renewable  |
| • properties         | • recycling      |
| • single use         | • non-degradable |
| • decompose          | • conditions     |
| • renewable          | • force          |
| • classification key | • plasticiser    |

Not sure what they mean? You could use a dictionary to check (paper or online).

## The Problem



Eve, an engineer at NISSAN, is looking for ways to make the company more environmentally friendly by sending any scrap plastics to be recycled rather than to landfill. Different plastics need recycling in different ways. NISSAN uses lots of types of plastics to make car parts (e.g. bumpers and dashboards) so they need to identify which parts are made from which plastics. Plastics are difficult to identify by appearance alone but luckily, they behave differently in different conditions. Can you use the classification key on page 2 to identify these household plastics to advise Eve?

## OUR METHOD

- Gather and label your **plastic samples** 1, 2, 3 and 4.
- Half fill your container with water and place each sample under the water before letting it go. Observe and record which plastics float and which sink.
- Using the same samples (removed from the water) fold a crease in to each piece of plastic. Fold each piece of plastic backwards and forwards to see what happens.
- Record your results in a results table, like the one on page 2, and use these along with the classification key to identify which type of plastic is which.



## How you will solve the problem...?

## Did You Know?

Many plastics are non-degradable, which means that they remain in excellent condition for a very long time.



Up to 250 years for a baby's nappy to decompose.



Up to 450 years for a plastic bottle to rot away.



Up to 1000 years for a plastic bag to degrade.

Did you know that some types of expanded polystyrene food cartons, like the one pictured, are made with a special ingredient called plasticisers to prevent them from breaking easily? This makes them great for holding food for longer but means they take much longer to decompose after they have been discarded.



**Recording your Results** – use the plastics classification key below to help you identify which types of plastic you have (final column).



	Plastic object	Does it float in water?	Does it snap?	Does it show stress whitening?	Type of plastic
1	shower gel bottle				
2	card/gift packaging				
3	takeaway carton				
4	pop bottle				



Here is an example of what **stress whitening** looks like:



Once you have completed your investigation and recorded your results, it is time to advise Eve and the NISSAN engineers how they can identify which plastic is which and send it to the appropriate recycling centre.

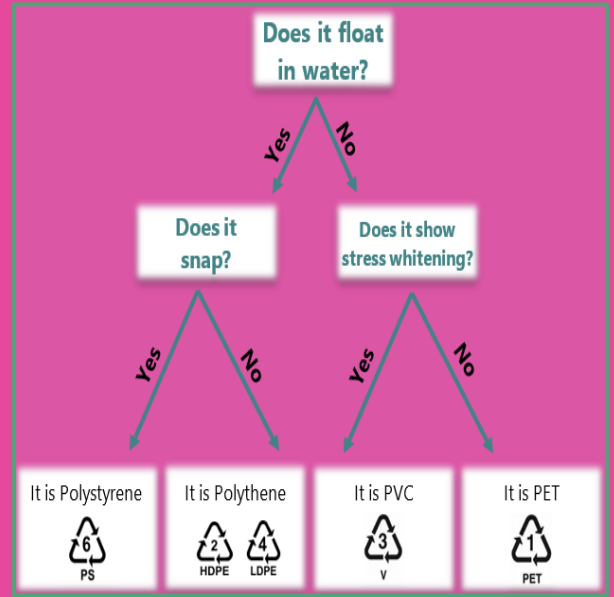
**THEY WILL WANT TO KNOW...**

- How did you carry out your investigation?
- What happened to each type of plastic in your investigation?
- What are your results?



Write a short report or make a video to share your results with **NISSAN**. Share it with us @ciecyork

**PLASTICS CLASSIFICATION KEY:**



	polyethylene terephthalate (PET)	Water bottles, soft and fizzy drink bottles, pots, tubs, oven ready trays.
	high-density polythene	Toys, picnic ware, household and kitchenware, cable insulation, carrier bags, food wrapping material.
	polyvinyl chloride (PVC)	Window frames, drainage pipes, medical devices, blood storage bags, flooring, vehicle interiors and seat coverings, fashion and footwear, packaging, cling film, credit cards.
	low density polythene	Squeeze bottles, toys, carrier bags, insulation, water tank linings, heavy duty sacks, general packaging, gas and water pipes.
	polypropylene	Bottle caps, cereal liners, lunch boxes, ketchup bottles, packing tape, straws.
	polystyrene	Toys and novelties, rigid packaging, refrigerator trays and boxes, cosmetic packs, CD cases.
	other types of plastics	Baby bottles, water cooler bottles, car parts.

**Sorting your recycling at home...**

The plastics you have been testing are just some of the different types of plastics that exist. Testing to identify all of the different plastic items would be too time consuming, so scientists have developed helpful codes which manufacturers often print on to the plastics they make. Take a look at the plastic items in your recycling box at home and the codes printed on them. Can you use this list of codes to identify them?



**TAKING IT FURTHER**

**Follow up activities and investigations:**

- Find out why many names of plastics begin with 'poly'.
- Research products which are made from recycled materials.
- Use [this website](#) to find out more about plastic recycling.
- Make a list of all of the items you use in one day which are made from plastic.
- List 5 reasons why plastic is fantastic. pros/cons
- Find out what happens to plastic items after your council collects them for recycling?



**Things to think or talk about:**

- How do you recycle in your home?
- How can you tell plastics apart from other materials?
- Are all plastics the same? What similarities and differences have you noticed?
- Why do you think so many things are made from plastic?
- Why is it important to recycle items made from plastic?
- What other household items are commonly recycled?

