

Polydensity bottles

Education in Chemistry

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rsc.li/2MZkp8Y

Kristy Turner

This activity accompanies the article *What a waste!*: rsc.li/2MZkp8Y

Introduction

The polydensity bottle contains four components:

- brine (salt water);
- isopropyl alcohol;
- two different types of beads.

In this task you will make observations and link these to ideas about density and to mixed plastics separation.

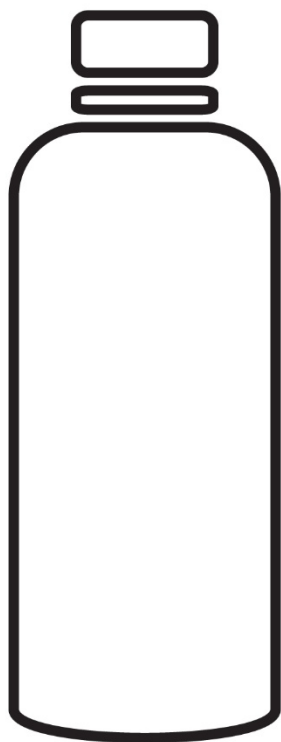
Observation exercise

1. Gently shake the bottle. Let the bottle come to rest. Sketch the order of the bottle components on the bottle template.
2. Pick the bottle up and twist it from side to side to thoroughly mix the contents. Sketch the order of the bottle components.
3. Set the bottle down and after a few seconds sketch the order of the bottle components on your bottle outline.
4. After around 30 seconds, sketch the order of the bottle components. You could also take a slow-motion video of your polydensity bottle.

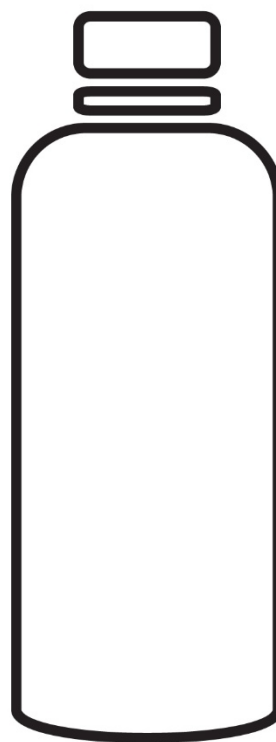
Questions

1. Look at your first sketch. State the order of density of the four components of the bottle.
2. When the bottle contents are mixed and the bottle set down (step three), there are five components in the bottle. What is the new component?
3. State the order of density of the five components present at step three.
4. Why does the new component gradually disappear?
5. When we recycle we mix together many different types of polymers in our 'plastics' recycling bin. Using the concepts you have worked with in this exercise, discuss how density could be used to help separate mixed plastic waste.

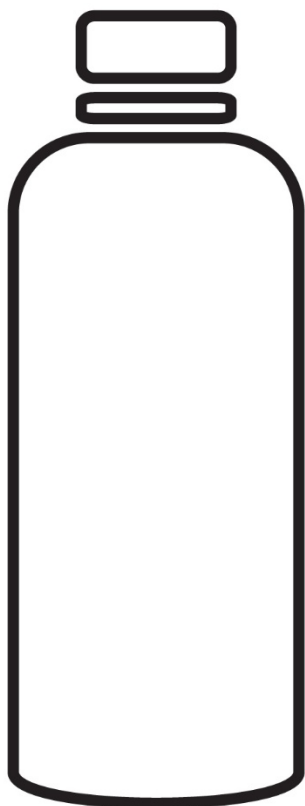
1.



2.



3.



4.

