

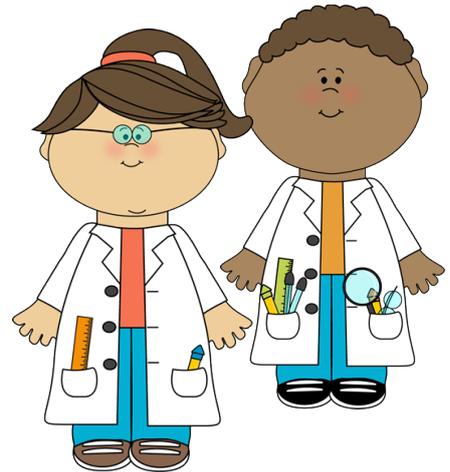
# SEPARATING MATERIALS

Video to support this activity: <https://youtu.be/2udGQ1VKlyM>

Recycling companies use materials properties to easily separate large amount of mixed recycling.

Think about what you might have in your recycling bin.

This process can work because different types of material have different materials properties for example different density, magnetic properties or they may be conductive.



## YOU WILL NEED:

- 3 x small bowls
- 1 x small sieve
- 1 x larger bowl or large measuring jug
- 1 x magnet (e.g. fridge magnet)
- 10 x metallic bottle tops (need to be magnetic)
- 10 x glass marbles
- 10 x plastic bottle tops
- Stopwatch (Mobile phone stopwatch)
- Water

1

### Investigate the materials

Take a metal bottle top, a marble and a plastic bottle top and place them in a bowl of water.



Which one of the objects sinks? \_\_\_\_\_

Which one of the objects floats? \_\_\_\_\_

The reason why some objects float and other sink is because of a property called 'density' which is how heavy something is compared to its size.

If you put an object in a liquid it will sink if it is more dense than the liquid but float if it is less dense than the liquid.

2

Take your magnet and see if your bottle tops or marble stick to the magnet.



Which one of the objects sticks to the magnet?\_\_\_\_\_

Which one of the objects do not stick to the magnet?\_\_\_\_\_

If your metal bottle cap does not stick to the magnet then it is not a steel bottle cap (steel is a mixture of more than one metal, one of which is iron).

Because not all metals are magnetic try to find metals that do stick to the magnet as these contain iron which is magnetic.

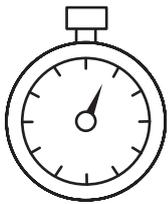
To learn more about magnetic materials visit BBC Bitesize page:  
<https://www.bbc.co.uk/bitesize/topics/zyttyrd/articles/zw889qt>

3

### Separate your materials

Take all of your marbles and bottle tops and put them in the large bowl. You now have a mixture of three materials.

From what you have learned about the three different materials in Steps 1 and 2 think about how you could use your sieve, large bowl, water and magnet to separate the mixture quickly.



Using the stopwatch see how quickly you can separate your mixture of three materials.

Try it again to see if you can beat your time or challenge your friends or relatives to see who can separate the mixture of materials in the quickest time.

## Health and Safety (remember to always use common sense)

Risk(s)	Precaution(s)
Cuts (due to sharp edges on cricked glass marbles, metal bottle caps)	Use smooth glass marbles and check none are broken (if broken ones are found dispose of immediately).
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Slips on spilled water	Set the experiment up so that the sections of the activity that involve water are done somewhere that will contain any spillage (e.g. in a tray or sink)