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Identify and separate plastic

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Not all plastic is the same

Identify and separate plastic

The research question

It is best to avoid packaging waste altogether. If that is not possible, we should reduce, separate and recycle the waste as much as possible. To do this, we throw plastic packaging waste into specific garbage cans. During subsequent recycling, the different types must first be separated. **What are the different types of plastic and how can they be separated?**

You will need:

- A collection of empty plastic packaging
- Small pieces of plastic made of PET, PE, PS and PVC materials
- Drinking glass
- Spoon
- Table salt

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Get to know all sorts of plastic

What type of plastic?

There are many different types of plastic packaging. They all end up together in a specific garbage can. For recycling, it is important to separate the different types of plastic well from each other.

Collect some plastic packaging made of different types of plastic. Chemists have very complicated names for them, but fortunately there are simple abbreviations.

Task

Look for the recycling symbols and abbreviations on the plastic packaging you collected. The abbreviation for the type of plastic is always under a recycling symbol. Write down the different abbreviations you find:

_____

_____

_____

_____

_____

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Separation

Floating and sinking

Plastic floats on water, right? Investigate the floating behavior of the different types of plastic you have found.

1. Fill a glass with water.
2. Immerse the first piece of plastic completely in the water and let it go.
3. Observe what happens: does it float, or does it sink to the bottom?
4. Test each type and write down whether it floats or sinks.

Abbrevation	Floats	Sinks
PE		
PS		
PVC		
PET		

The different floating behavior can be used to separate the plastic types during recycling.

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Separation

Procedures

You learned which type of plastic sinks in pure tap water and which floats on top of the water. What happens when you change the properties of the water by gradually adding salt? Try it out!

Task

1. Fill a glass with 250 ml of water.
2. Add the plastic pieces from four different types of plastic to the beaker and stir briefly.
3. Now add a small spoonful of table salt, stir with a glass rod for about 30 sec.
4. Wait a little while until the water has settled.
5. Repeat this four more times. You will have added a total of five spoonfuls of salt.
6. Note your observation:

   PE:_____

   PS:_____

   PVC:_____

   PET:_____

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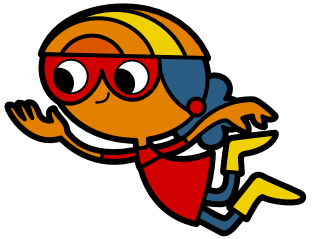
Further information



Context

The devastating consequences of plastic waste in the environment are well known. One general strategy against this is to avoid plastic packaging. Another measure is the recycling of plastics. This works best if they can be separated by type in the recycling process. To do this, you need to know the types of plastic and their different properties. In this unit, we will learn about common types of plastic and investigate how to use their density for separation.

Plastic density and separation

In plastics recycling, the different densities of the materials are often used for separation. One variant is the float/sink process: Some plastics float on water, others sink. This allows a first rough separation into two categories. A further division is possible if the density of the water is gradually increased by adding table salt or sugar, thus causing more types of plastic to float.