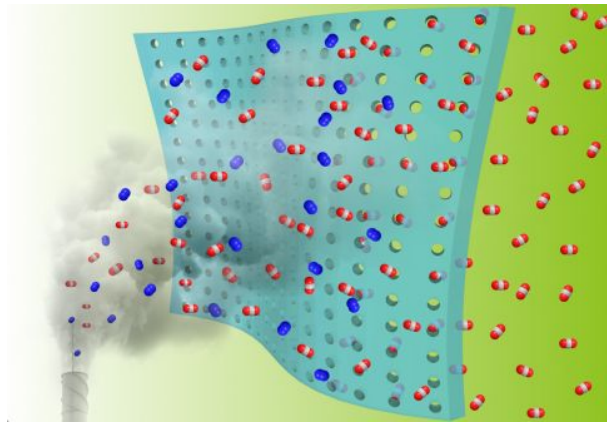




# WEEK 15 - STATES OF MATTER



## Science in the News



The blue square in this picture represents a filter that only allows carbon dioxide through (red), and stops harmful gases getting past (blue).

Credit: Zhenzhen Yang/University of Tennessee



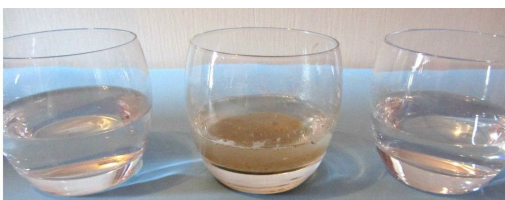
## Try it at home - Dissolve it!

### What do you need?

- A glass or clear container
- Cold and warm water (always ask an adult if you are using the hot tap)
- A teaspoon
- A selection of items to test. For example, we suggest sugar, salt, flour, sand, paprika, ground pepper and marmite
- A pen
- A piece of paper
- A timer or clock

### What am I learning?

Some substances dissolve in water, others dissolve in warm, hot or boiling water, and some don't dissolve at all. If you want to learn more about the science behind this, check out our lesson on our website - [Science Creates Outreach](#)



### Parents:

For primary learners, work through our full 'states of matter' lesson with your child. It is based around the national curriculum learning objectives found in the year 5 'Properties and changes of materials' topic. Download - [Science Creates Outreach](#)

For secondary learners, the contents can be discussed in more depth using the [original online article](#).

### FILTERING CARBON DIOXIDE

Scientists are working on a new type of filter than can selectively filter carbon dioxide (CO<sub>2</sub>) from harmful emissions. CO<sub>2</sub> is a major contributor to climate change, which is causing droughts, storms, and many other problems. Currently there are different methods of 'trapping' CO<sub>2</sub> before it is released into the atmosphere, but these processes use a lot of energy and aren't very efficient.

When CO<sub>2</sub> is produced, it mixes in the air with non-harmful gases like nitrogen and oxygen. The new filter works by using a material that is attracted to CO<sub>2</sub> and not other gases in the air. The main material is fluoride (the same thing that's in your toothpaste!) so it's cheaper and easier than other forms of 'carbon capture' that are currently used. However, there still needs to be research on what to do with the carbon dioxide once it's been filtered, so there is still a long way to go!

### Instructions:

1. First, get your paper and pen ready to make notes. The best way to do this is to draw a table, with the names of your items down the first column and the words 'dissolves', 'does not dissolve' 'time in warm water' and 'time in cold water' along the top of the columns.

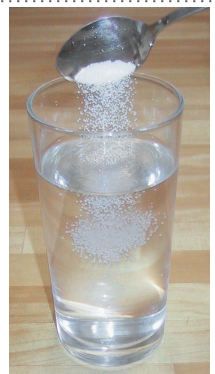
2. Next, fill a glass with cold water.

3. Then, take your first item and put it into the water e.g. a teaspoon of salt

4. After that, stir it around in the glass with a teaspoon and observe carefully as you do. If your item dissolves, you will no longer be able to see it. If you're still stirring and timing after 3 minutes, you can tick that this item does not dissolve. Top tip - if you have a timer, turn it on now and time how long it takes to dissolve.

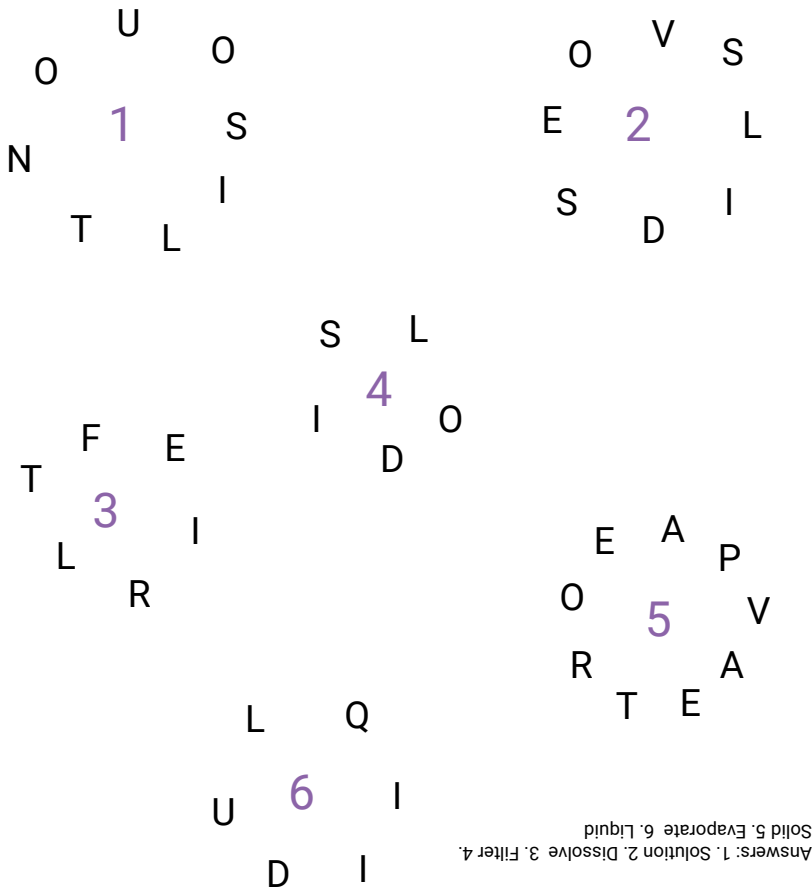
5. Repeat this with every item you have chosen, making sure you write down your observations.

6. Finally, repeat again but with warm water (always ask an adult if you are using the hot tap).





# WEEK 15: STATES OF MATTER



Answers: 1. Solution 2. Dissolve 3. Filter 4. Solid 5. Evaporate 6. Liquid



## Read, Watch, Ask



Have a read of our [lesson](#) to learn more about states of matter.



What are the states of matter? Watch [here](#) to find out.\*



Got any questions about today's topic? Email us at [info@sciencecreates-outreach.co.uk](mailto:info@sciencecreates-outreach.co.uk) and we'll answer them!

## Did you know?



We can change the state of matter of *any* material by changing the temperature it is at. Everything has a 'melting point' - where it turns from a solid to a liquid. And a 'boiling point' - where it turns from a liquid to a gas. The melting point of water - where it turns from solid ice into liquid water - is 0 °C, but the melting point of glass is 550 °C! That's why some things are solid at room temperature, and some are liquids or gases.

## Be Inspired...

In this section we interview inspirational members of the Science Creates science community so that you can learn more about different jobs, what they involve and how you can do the same! This week we interviewed Jaspal from a company called Phylo Bioscience.

### What does Phylo do?

Phylo bioscience is looking for human microbiome. There are good and bad bacteria in our body, called microbiome. Good bacteria helps us to maintain and improve our health while bad bacteria can lead to bad health. For example, in our saliva we have some good bacteria helping us digest the food we eat and bad bacteria that can cause us dental problems like caries.

### What is your job title and what do you do?

I work as a laboratory director. We use human saliva as a sample. Every bacteria has a unique genetic code and my job is to detect the code by doing a science technique called real time PCR and then report it.

### Do you like your job? Why?

Yes, I like my job, this is a dream job for me. I like the scientific activities involved in my job.

### How did you get your job?

To do my job you need to go to university and study the subjects in detail. I studied at the university for 6 years and then did a PhD for 3 years in Neuroscience, followed by research work for the next 7 years. My advice would be to always do your homework and later get work experience. Most importantly, you must have a great passion about your job.

### Have you always wanted to be a scientist?

Yes, I always wanted to work in science. According to me the best job is where you can apply your knowledge and skills, learn new things and stay happy.

phylobioscience™

