

DIY bacteria detector
 Curious if your soap works? Test if there are less bacteria on your hands after washing with our DIY bacteria detector. Instructions and more information can be found at togethersciencebus.eu.

Caution! Very strong acids and alkaloïds are corrosive, which means they are harmful to your skin or when inhaling them. Always handle these substances with utmost care. Wear gloves and safety glasses!

How do you make soap?
 To make soap you need fat tails and heads that like water. You can easily make this yourself by letting fatty acids (from a vegetable or animal source) react with solution of sodium hydroxide (NaOH). This solution has a pH level of 13 or 14 and is thus very alkaline (or basic), the opposite of acid. It reacts with the acid and adds an aquatic head to a fat-loving tail. This reaction is called saponification.

What is soap?
 Water and oil (or fat) do not mix well. Soap is capable to mingle those two. A soap molecule looks like a tadpole: a bold head that likes water and a tail that likes fats. Soap dips its head in water and its tail in the fats, making water and oil blend. This mechanism also allows soap to remove dirt. Soap puts its tail in the dirt (where there is no water) while the head is looking for water. When washing your hands, small spheres of dirt or fat surrounded by soap will be taken away by the water, cleaning your hands.

Introduction
 Washing your hands before you eat is a natural thing to do – and if they are really dirty or greasy, soap can help of course. But what is soap? And how does it work?

Ingredients and requirements:

- 7.5 gr Coconut oil • 2.5 gr Bees wax
- 7.5 gr Shea butter • 7.5 gr Sunflower oil
- 3.33 gr caustic soda (NaOH)
- 9.5 gr distilled water
- Bowl or jar
- Heat source (cooker or stove)
- Mold
- Spoon (RVS, wood or synthetic)
- Heatproof bowl or jar, e.g. jamjar
- Small pan or 2nd heatproof bowl
- Safety glasses
- Gloves
- Potholder
- Thermometer
- Scale
- Saucer

check out

togethersciencebus.eu



waag society



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 709443.

**DO-IT-TOGETHER
 SCIENCE
 BUS**



collecting folk remedies
 do it together & find out how things work

Make your
 own soap

Make your own soap

Soap removes bacteria from your hands, which is important for your health and gives a clean feeling. Follow these instructions to make your own soap:

1



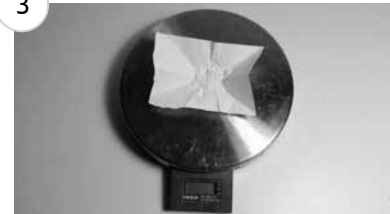
Measure the water in the bowl or jar you are using.

2



Measure all fats and oils in the pan or the second jar.

3



Make sure to wear gloves. Measure the sodium hydroxide on the platter.

4



Heat the fats and oils at a low grade to 50°C. Keep the pot or jar at an angle when you are measuring the temperature.

5



Attention: Make sure you wear safety glasses and gloves!

CAREFULLY add the granules of caustic soda to the water. This gets hot and can splash.

6



When both liquids are at $\pm 50^\circ\text{C}$, you can add the caustic soda solution to the fats/oils substance.

7



Stir well and keep at 50°C until a thick pulp develops. Optionally, add the scent and/or scrub to the mixture.

Tip: if you are with two people, or if you want to add something else to your soap, divide the mixture over 2 jars.

8



Pour the mixture in a mold and wait until it is hardened.

Tip: In the meantime you can make a nice wrapping for your soap.

9



When the soap is dried, you can release it from the mold. After 6 weeks you can use the soap.

Tip: to see whether your soap works, use the bacteria detector. Instructions can be found at the website togethersciencebus.eu.