

# LEARN HOW TO MAKE SOAP

A BEGINNERS GUIDE TO  
COLD PROCESS SOAP



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# Welcome.

We'll soon have you making your own soap

Your Teacher is Emma  
FitzGerald



I've been making soap and other bath and body products for 10 years since psoriasis and a third child made me desperate for soft skin!

I have been teaching soapmaking since 2010.

I have a background in science, achieving a BSc (Hons) in Genetics and a Masters Degree in Medical Laboratory Science from Queens University, Belfast. I was also awarded a Postgraduate Certificate in Science Education from University College, Worcester.

I founded Purple Herb Soap in 2010 which I closed in 2015.

I now enjoy teaching Soapmaking and Fused Glassmaking to curious and resourceful individuals at the Hazelrock House Studio in Stirling, Scotland

I'm now here to help you to begin your journey onto Soapmaking. Don't worry, I've got your back.

[www.hazelrockhouse.com](http://www.hazelrockhouse.com)

# In This Guide You Will Learn

What soap is and how it works

Equipment you need

Soapmaking ingredients

Working safely with Lye

Great oils to use

Five Great Soap Recipes to choose from

Step by step instructions for your first batch

Finding Trace

Cleaning up

Unmoulding, Cutting and Curing your soap

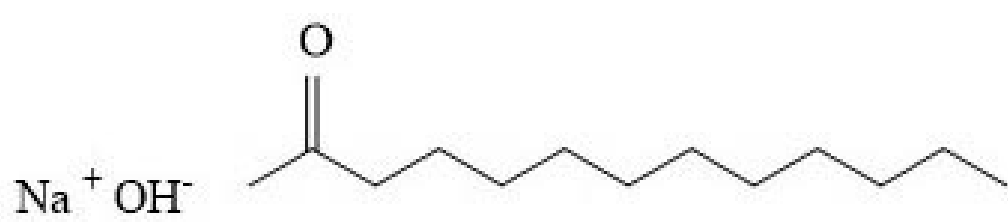
Essential Oils and Fragrance oils for scent

Pigments and Micas for colour

The Next Steps

# What Soap is and How it Works

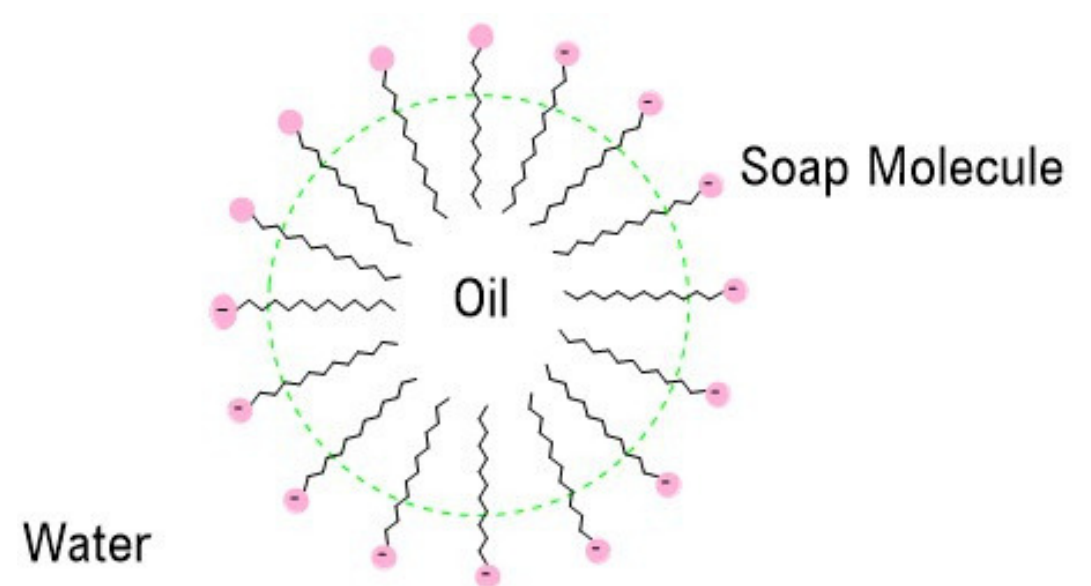
Soap is a surfactant...which is just really a fancy word to say that soap enables oil and water molecules to mix by lowering the surface tension of the water. It is able to do this because it has 2 ends, one which will mix with water and one which will mix with oil and so it forms a bridge between them. In fact, it causes the droplet of oil to become suspended in the water. The dirt usually is in the oil particle which can then be washed away easily.



Chemical Structure of a Soap Molecule



Simplified Structure of a Soap Molecule



An Oil Particle  
Being Held in Suspension  
by Soap Molecules

## Always use a good recipe

While it is very interesting and useful to find out how soap works and all about the chemical reaction that makes soap, you can still make soap without knowing it.

You need to make sure you are following a recipe though. It is a precise process and won't work if you just randomly start throwing oils and lye together. In fact, you could make a soap that is dangerous for your skin. So please use a recipe from a reliable source if you don't understand how to formulate your own yet.

Here comes the science bit...

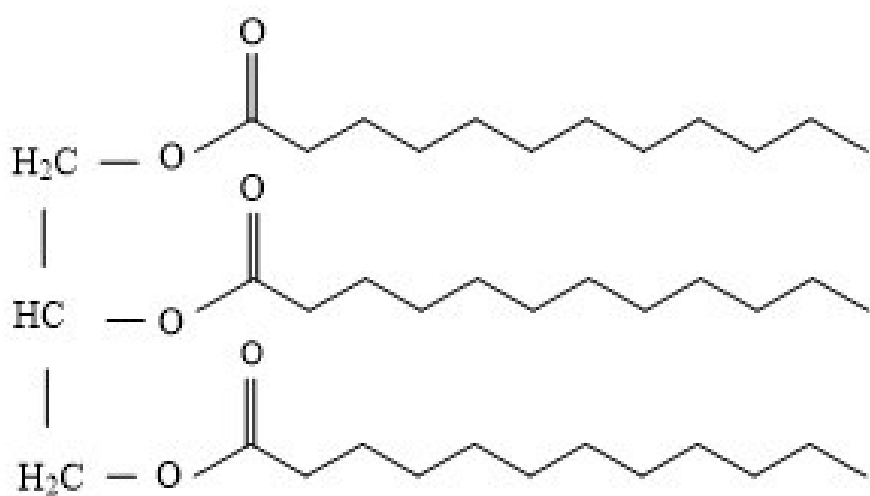


# Saponification

The chemical reaction that occurs is called Saponification.

Soap is made from two basic ingredients, Sodium Hydroxide (lye) and oil.

These two ingredients combine together chemically to make a new substance, soap. Glycerin is produced as a by-product of this reaction which is good news. Glycerin is very good for your skin. There isn't any lye left in the soap at the end as it all gets used up in the chemical reaction.



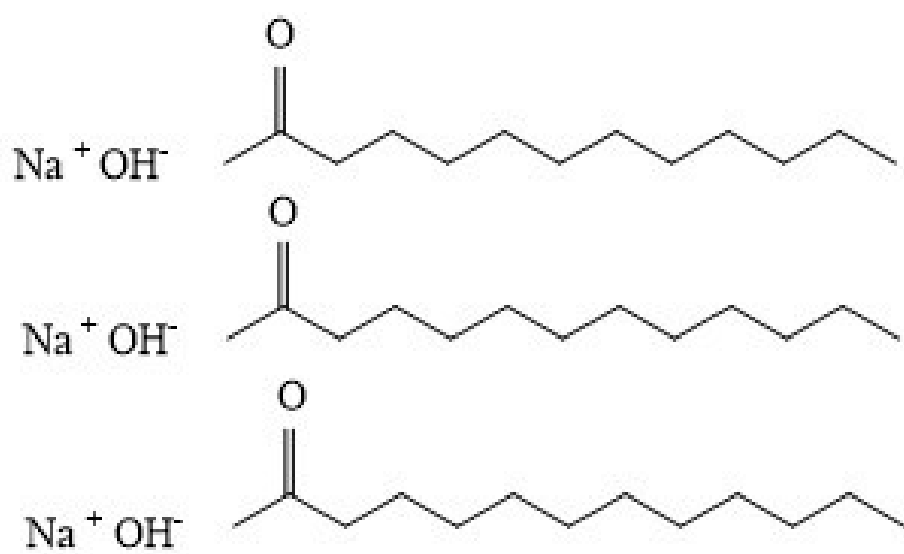
Triglyceride (fat) Molecule

+



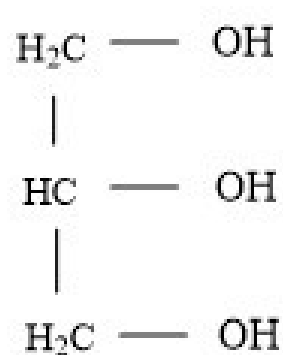
3 Lye Molecules

=



3 Soap Molecules

+



Glycerine

This is what a molecule of oil looks like  
(in chemical terms)

We can see it has three long tails to the right.

These are fatty acids

The fatty acids combine with some of the molecules from the lye to make soap.

Because there are three fatty acids to each oil molecule, it takes three molecules of lye to react with it.

These are three soap molecules. You can see that they no longer have the original portion that was on the left of the oil molecule. Now each fatty acid has part of the lye molecules instead.

This is the part of the oil molecule that is left over. It has combined with part of the lye molecules to form glycerin/glycerine.

# Equipment

Weighing – Scales are a necessary piece of kit. It's not possible to use measuring equipment instead because all the ingredients for soap making are measured by weight. This is due to the need for accuracy. I would recommend spending some money on some scales if you don't have a set already. They are not expensive and can be bought online, in an electronics store or your local large supermarket. Choose an accurate one as possible with a digital readout.



Chopping – You'll need to do this to break up any oils such as palm or coconut oils which generally come in large blocks. A suitably sized knife is perfect for this. Soap additives such as petals, leaves and herbs may also need to be chopped up before adding.



Melting – Hard (solid at room temperature) oils will need to be melted before you can use them. You can put them in a stainless steel pot on the stove or you can use a microwave (obviously use a plastic bowl in the microwave). You'll need to let them cool a bit before they will be at the correct temperature.



Stirring and scraping – Spatulas are perfect for this. I love to get every last drop out of my soaping bowl. Plastic or silicone is best as wooden spoons tend to react with the lye as does aluminium. You can use stainless steel spoons as they don't react but they are not as good at scraping.





Measuring temperature – It's really handy to have a thermometer as a new soap maker. You can easily make sure the temperature of your oils and lye mixture is within the recommended range before you start. All soap makers have their own preferred temperature at which to soap. I prefer just above room temperature so I don't really use a thermometer much anymore. But it is useful to have one until you find your own preferences. You can get them in any kitchen store or online if you don't already have one.



Bowls and jugs – Anything big enough to fit your soap recipe is perfect. Again plastic is best but you could use a ceramic bowl too. Stainless steel pots can also work but make sure your pots are not made from aluminium or they will react with the lye present. Make sure the jug you use for the lye mixture can resist a fair amount of heat. Mixing the lye with water is an exothermic reaction, so glass is not the best plan. Even pyrex can become etched by the lye solution and break. Heat resistant plastic is best but many soap makers use stainless steel metal jugs. You will need smaller containers for mixing colour into portions of your batter. Small bowls are very useful for mixing powdered colour with water or oils or you can use paper espresso cups if you prefer.



Mixing – You can mix by hand in which case all you will need is a long handled spoon or a whisk to stir...but this can take a very long time. Most soap makers use an immersion (or stick) blender. This allows very fast mixing without the addition of bubbles to the mixture. Electric mixers (the type with beaters), are not the best as they add too much air to your soap mixture causing air bubbles in the finished soap.





Moulding – just about anything can be used for a mould if it is lined. My first soap was moulded in a plastic lunchbox. Or you can use an empty milk carton (washed first of course), a Pringles carton or a yoghurt pot. Silicon cooking moulds are very convenient as they don't need to be lined and are easily removed from the soap. The variety of moulds you can buy once you are ready is quite staggering. Many soap makers make large blocks of soap which they then cut up. You can buy moulds but you can also use any type of box you like and line it.



Swirling and patterning – Once you have made your new batch of soap you might want to swirl the colours together. Chopsticks are perfect for this, small spoons are great, a wire clothes hanger can be bent into a swirling implement, almost anything you can think of that will move the soap around can be used. Patterns can be made on top of the soap to give it texture. You can be as creative as you like.



Insulation – If you choose to insulate your soap you will need a few old towels or blankets to wrap around it. You may also want a piece of cardboard to cover your soap if your mould doesn't have a lid.



Table protection – Soap mixture is very likely to damage your table surface as it is very caustic. You can use a paper tablecloth, an old piece of fabric, newspaper, a layer of cardboard or anything similar to protect your table.





You will find that it's not a great idea to use the equipment you make soap with for food once more. This is not because it is dangerous but if you have used fragrance in your soap, the fragrance can be absorbed into the plastic jugs, spatulas or other equipment. I always keep mine separate now after an unfortunate incident with lavender scented toast! If you are making an unscented batch for the first time it won't matter so much.

And a final word about equipment...Never put soapy dishes in the dishwasher. It will ruin the seals around the doors if the soap is still caustic. If it was yesterdays soap dishes, you will end up with soap suds seeping out the side of your dishwasher. Go on...ask me how I know this!

The best thing to do with dirty soap dishes is to scrape them out as well as possible with a spatula before putting them all in a bag and leaving them somewhere safe (away from pets, kids and other people) overnight. In the morning the greasy caustic soap will have turned into bubbly soap and you won't even need washing up liquid to get them clean.

## Lye Safety

Many people who want to make soap are put off by the use of Sodium Hydroxide (Lye) in the making of it. The fact is that you need lye in order to make soap from scratch.

If you really don't want to handle lye, then you can use melt and pour soap, which is great, but you don't have the same level of control over the ingredients you put in. It's like using a store bought mix to bake a cake...It tastes fine but you can't vary the recipe. And creative people like us...let's face it, jiggling the ingredients is what we are all about.

I'm here to tell you the best ways of dealing with lye so it is safe to use. After all, you wouldn't be put off making a cup of tea or coffee because you need to work with boiling water. You wouldn't want that on your skin either. It's all about managing the risks.

## Safety Equipment



Safety equipment is very important, but you don't have to go full Hazmat on it!

Goggles and gloves are absolutely necessary for safe lye handling. I know you don't want to wear them and they get in the way but they really could save you from a nasty burn or significant eye damage.

Keep the goggles on until after your dishwashing is finished. It seems like overkill but I personally have been splashed in the eye with caustic fresh soap whilst doing the dishes.

It's important to wear closed toed shoes so you don't get any on your feet if you do have a spill. Some books advocate the use of long sleeved tops but I find they can hold lye solution or fresh soap next to your skin so I prefer short sleeves. You can then wash any splashes off straight away.

If I am doing a complicated procedure with the soap eg piping or layering, I use the plastic sleeves that scientists use. I tend to be messier whilst piping and they are easily available on Amazon if you don't fancy the bare-skinned route. You can then just throw them away after use and they don't let the lye soak through to the skin.



## Lye Storage

Solid lye awaiting use should be kept in an airtight box as it absorbs moisture from the air. Some books say that absorbing water weakens the lye, but it just means that your measured weight is composed of both lye and water, so there isn't enough actual lye in your soap at the end. And more water than you wanted. Label the box well and keep on a high shelf out of reach of children or pets. If you are storing lye solution, this advice goes double. You must keep the lye solution out of reach of children and pets. Make sure you keep it in a non-leaking container with a lid once it has cooled down. Hot solutions should not be kept in closed containers in case the pressure builds up inside.



## Distractions

Make sure children and pets (and maybe partners!) are well out of the way and won't come into your soap making area during the soap making. If you want you can turn off your phone or TV as well if you find them distracting. Leave that lovely glass of wine until after the soap making session, you'll need a clear head. Reward yourself after you are done instead

## Mixing the lye solution.

Mixing is best done in the sink so any spillages can be easily contained. The dissolution of lye in water creates a huge amount of heat, and plastic jugs sometimes are not up to the job. You can test your jug beforehand by filling it with boiling water (in the sink) and seeing if the plastic resists this kind of heat. This is a similar level of heat produced by the chemical reaction so it's a good indicator of how your plastic will perform. Many soap makers use stainless steel jugs instead to be sure but avoid aluminium jugs as they will react with the lye solution. We will go into step by step detail about how to mix the lye when we make our soap.

Always add the lye to the water. This is to prevent the water heating and spitting as it is added as the chemical reaction happens very fast. If you add lye to water, the lye will not spit and heat up as fast as the quantity of water is bigger.

## Oils to use for beginners

Good oils to use for beginners are generally going to be the ones that you can get hold of cheaply and easily in your local supermarket. There is no point in investing a lot of expensive oils for your first batch of soap.

Each different oil has different properties, therefore each will make a different kind of soap. Having a mixture of oils can give a much better spread of characteristics to the recipe.

Oils which are solid at room temperature (known as hard oils) make a solid, harder bar with more body. Oils which are liquid at room temperature tend to make softer soap (with some exceptions!).

Olive oil is probably the most popular of oils to use. It is easily available, relatively cheap compared to some oils and it makes a mild soap with a hard long lasting bar. Palm and Coconut oils are popular for their ability to make a hard bar. Coconut also produces fantastic lather but can be quite drying if used in large quantities. Palm is great for giving the bar body and making it last longer in the shower.

I have provided 5 different recipes which are all great for beginners and will make a bar with a good balance of characteristics.

# Your First Soap Recipe

I have formulated 5 recipes for you to try. Each has a different combination of oils and you can pick one depending on what oils you have to hand and what your own preferences are.

## Bastile

This recipe contains only two oils. Olive oil and Coconut oil. It is named in honour of the simple Castile recipe used in Spain hundreds of years ago. Castile soap uses only olive oil so this one with added coconut has become known as Bastile.

Olive Oil	300g
Coconut Oil	100g
Lye	56g
Water	150g

## The Holy Trinity

Anne Marie Faiola from Brambleberry refers to Olive oil, Palm oil and Coconut oil as the 'Holy Trinity' of soapmaking oils, and with good reason too. This combination ensures a hard bar with body and loads of lather.

Olive Oil	180g
Palm Oil	120g
Coconut Oil	100g
Lye	56g
Water	150g



# The Farmers Friend

This recipe uses tallow as the main hard oil. It makes a very creamy and luxurious bar. Tallow by itself doesn't lather very well so in this recipe I have combined it with bubbly coconut oil and conditioning olive oil.

Tallow	200g
Coconut Oil	100g
Olive Oil	100g
Lye	57g
Water	150g

# Sunshine Soap

Sunflower oil is cheap and readily available so a great beginner oil to use. It makes a conditioning bar which is gentle to the skin but should only be used as part of the oil component of the soap.

Coconut	120g
Olive Oil	200g
Sunflower Oil	80g
Lye	56g
Water	150g

# Rapeseed Soap

Another cheap and easily found oil is Rapeseed oil. If you haven't heard of it, you can often find it labelled as vegetable oil. Just make sure you check the label before you buy.

Coconut Oil	100g
Palm oil	100g
Olive Oil	120
Rapeseed oil	80g
Lye	56g
Water	150g

# Step by Step Instructions

## STEP 1 How to make the lye solution

Put on your safety glasses and gloves. If you wish to use a face mask you can put that on now too.

You need to make your lye solution in a well-ventilated area, so open the window above your sink, do this under an extraction fan or even do this stage outside if you prefer.

Weigh out the correct amount of lye using digital scales.

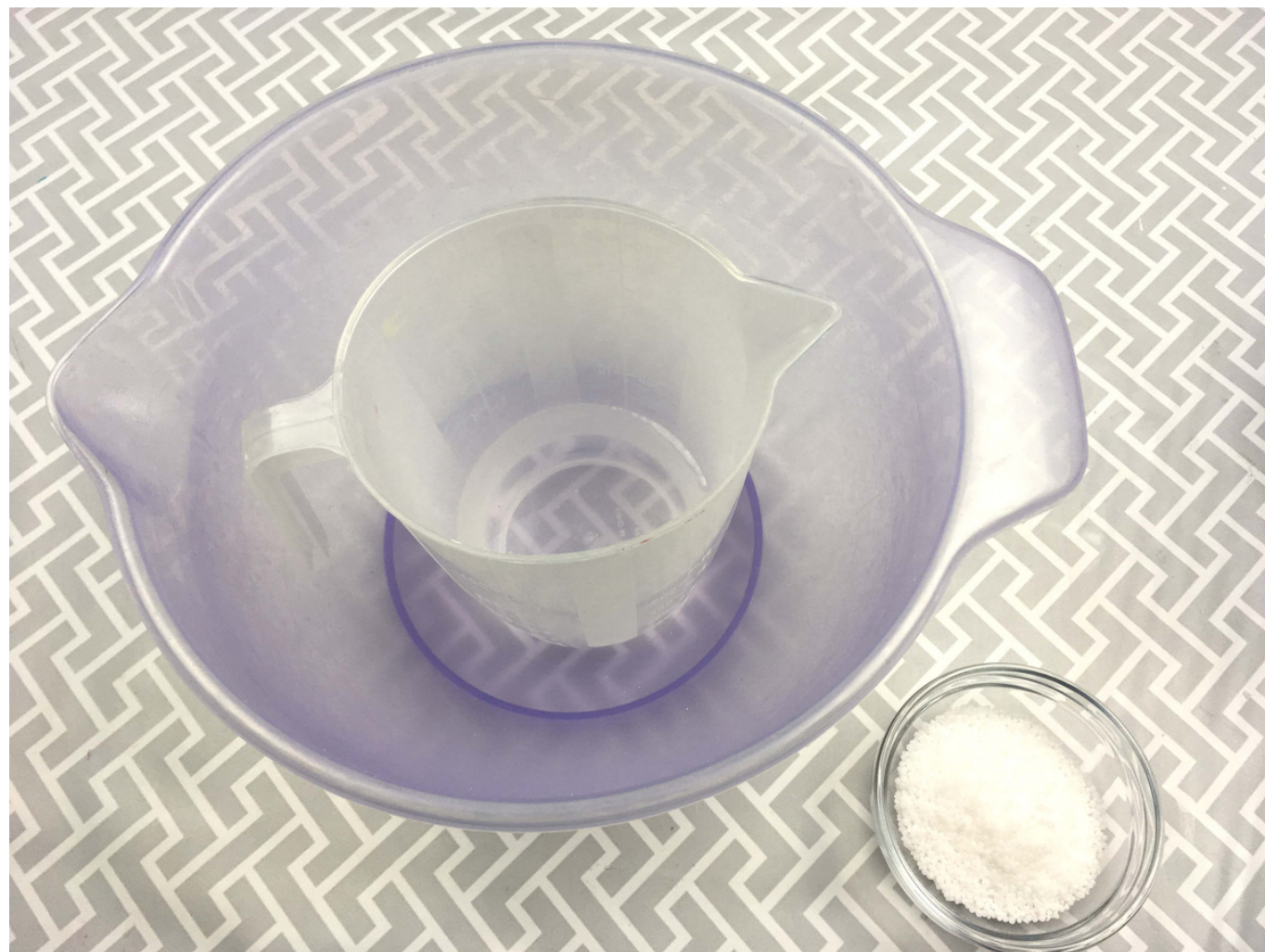


Weigh out the correct amount of water using digital scales. For soapmaking, water is measured as if it is a dry measurement. Just pop a jug on the scales, add water until the scale reads the same as your recipe calls for.





Put your water jug into the empty sink or a large plastic basin or bowl.



Pour in your measured lye.



Stir immediately for a few minutes so that the lye particles don't settle on the bottom.

Cover with cling film.

Keep Stirring for a few more minutes. If you don't stir long enough, the lye will harden in a block and not dissolve. Keep stirring for around 5 minutes with the cling film still on.





Leave to cool until it reaches around 30°C

Just a reminder to do this where no pets, kids, partners etc can disturb you.

When your lye solution is made and cooling please make sure you put it in a safe place out of reach of anyone else while it cools. Don't put a lid on the container while it is hot in case the pressure builds up inside.

## STEP 2 Prepare Your Oils

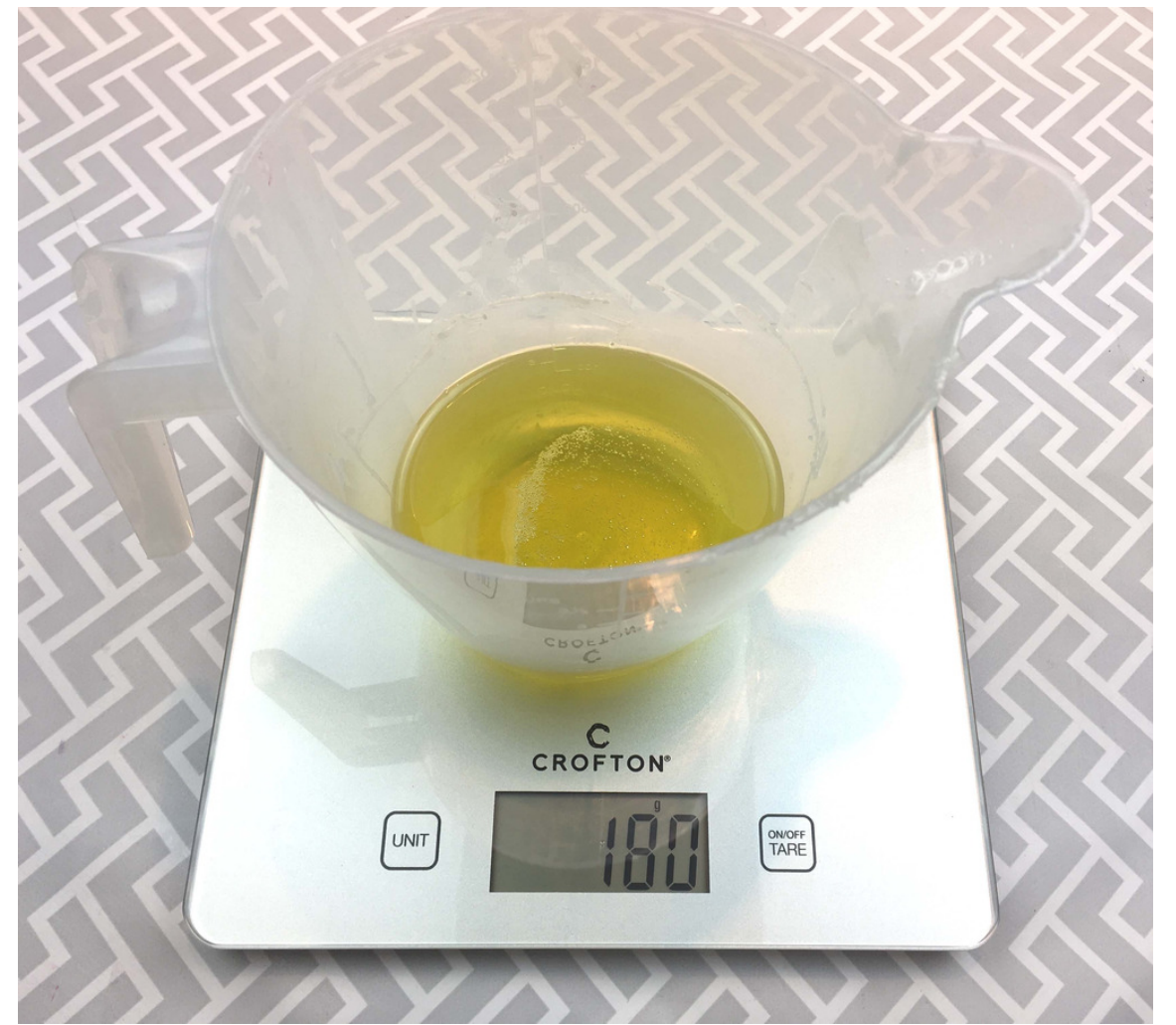
When making anything, it is good practice to make sure you prepare your ingredients in advance. That way you will always know that you have the right things to hand when you need them.

Have a copy of your recipe ready. Get out all the oils that you need to weigh and have them ready on your table.



Get your digital scale out of the cupboard, put it on the table and switch it on. Start weighing your hard (solid) oils. Weigh each one separately and then put it in a large plastic bowl.

Weigh each soft oil in turn and put into a jug.



## STEP 3 Melt Your Oils

Put the bowl of hard oils in the microwave and let the oils melt. (You can also do this in a saucepan if you don't want to use a microwave).

Heat the oils very gently until just melted. You don't want to heat them up too much. Use as little heat as it takes to melt them.

Once the hard oils are melted, you can pour the soft oils into the same bowl. This helps to cool the hard oils down and lessens the waiting time before we can begin to mix the oils and lye solution.



## STEP 4 Line Your Mould



## STEP 5. Mix it all together.

Now you should have your cooled oils in a large bowl and your cooled lye solution in a jug.

You should make sure you have your goggles and gloves still on and you should make sure your table surface is protected against any splashes or spills.

You will be mixing everything in your large plastic bowl and you will be using a stick (emulsion) blender to do so. Get it ready now and make sure you plug it in.

Arrange the large bowl of oils and the jug of lye solution on the table in front of you.





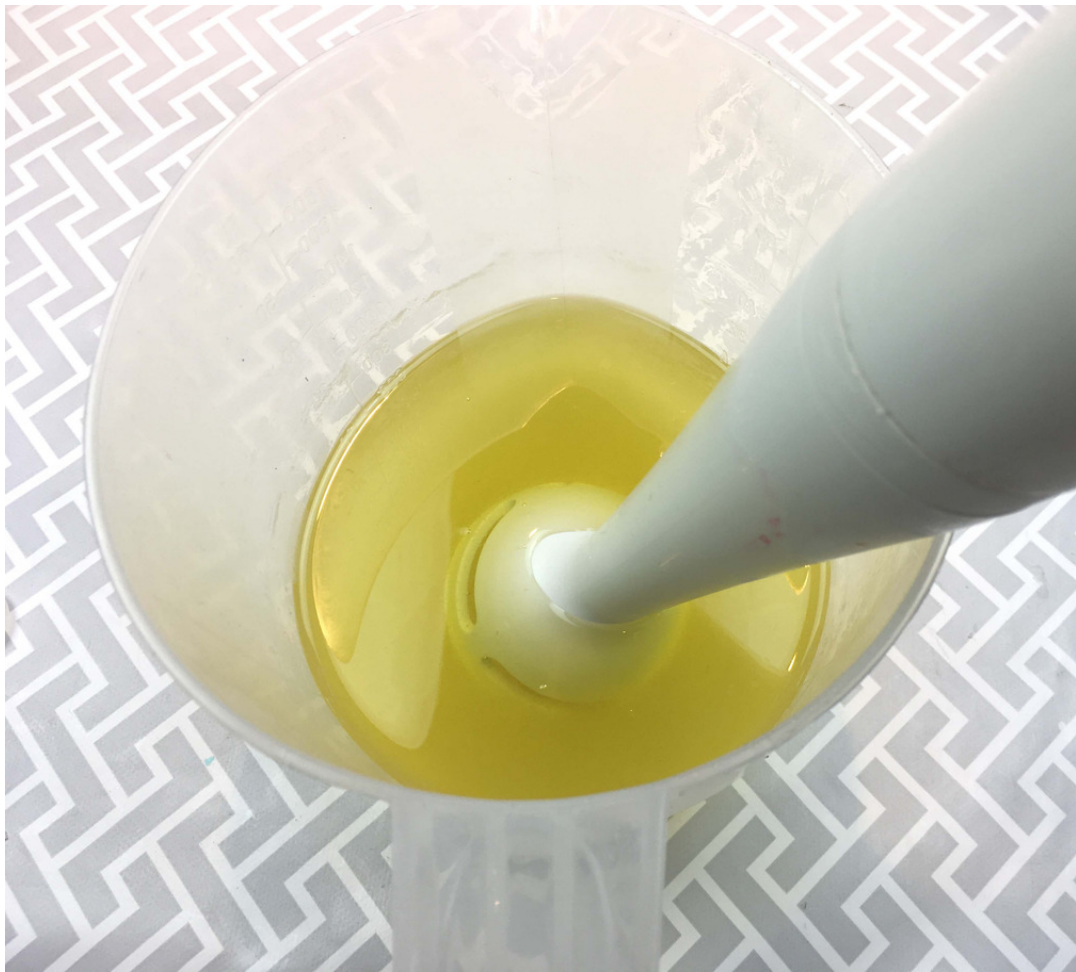
Make sure you have your lined mould ready beside you. You won't have time to line it before you pour the soap so make sure you have done this in advance.

Carefully pour the lye solution into the large bowl full of oils. Don't pour the oils into the lye as it could cause lye to splash up.

You'll see two layers now in the bowl. It's not immediately obvious in the second picture but you can see it has turned cloudy. It has started to become soap already.







Use your stick blender to gently mix them together. Go easy on the blending at first so you don't cause any to splash out the side of the bowl. Blend in short pulses and check the consistency of the soap often.

Keep blending until you see 'trace'. Trace is when you can drizzle a little bit of the soap onto the main body of soap in the bowl. The drizzle will sit on top for a few seconds before sinking back into the mixture.



Trace is easier to see in the photograph on the right. It isn't the same soap but the picture is better!



Pour quickly into your lined mould and scrape any excess out of the bowl with a spatula.

Woohoo...You've just made some soap!



## STEP 6. Put That Soap To Bed

What a strange thing to say!

Well, your soap really does need to be put to bed.

First, you need to put a lid on your mould. If you are using a lunchbox, then it will already have a lid. Put it on. If you are using an open box or some other kind of open container, you'll need to make a lid from cardboard or similar.

We do this because you are now going to wrap your covered soap up in old towels or an old blanket to keep it warm. Tuck that soap in nicely!

The soap making reaction creates heat and we want to keep that in so that the reaction will keep on going. Don't worry if you can't wrap it up. The soap will still be fine, it just will happen more slowly.

If you peek at your soap while this is happening and see that your soap has turned darker and gel-like, don't worry. It is totally normal. When we keep the heat in like this we cause the soap to go through gel phase.

You'll need to leave the soap in the mould for around 24hrs until it is ready to cut.





## Step 7. Cutting your soap.

Once the 24hrs is up, you can remove the soap from the mould. Different recipes will take different times in the mould depending on what oils they contain. You can remove them whenever they feel hard enough.

Take the whole block of soap out of the mould and peel off the liner.

You can then put the soap block you have just made on a chopping board or similar surface and just cut it with a knife. A thin knife is best as a very thick one will tend to make the bottom of the soap break and crumble off.

Each of the recipes in this guide makes around 6 x 90-100g bars. You can cut them whatever size and shape you like.





## Step 8. Curing Your Soap

Saponification (the soapmaking chemical reaction) mostly takes place in the first 24hrs after making the soap. But the soap is not ready to use then. We need to leave it for 4-6 weeks to harden and for the bar to develop into a mild and hard bar.

Put your soaps into a shallow container so that air can freely travel around the bars. A shallow box or tray on a shelf is ideal.

Leave them there for 4-6 weeks, turning them occasionally so all sides can dry out equally.

Then enjoy them!

# What's Next?

For your first try, I would recommend making the soap unscented and uncoloured, so you can experience the process without too many complicated steps.

But let's face it. You will want to add colour and fragrance to the second and third batches!

## Some Tips To Get You Started With Colour and Fragrance.

Weigh out your fragrance and put it into a small bowl or cup. Be aware that essential oils can eat through plastic so I use small glass bowls. Add your fragrance at trace and blend thoroughly.

Some fragrances will speed up the chemical reaction, some will slow it down and some will have no effect. Take careful notes so that you'll know which ones to choose again.

Prepare your colours. For mica, you can mix with a very small amount of oil. It is best to use a disposable container such as a paper espresso cup for this as cleaning micas off can be very annoying.

For pigments such as oxides and ultramarines, you can add a small amount of water and stir until all the pigment is dispersed. It will settle out again if you leave it, so make sure you give it another stir before you add it to the soap.

Titanium Dioxide, (a white pigment), sometimes comes in oil soluble or water soluble forms so make sure you know which one you have.

Many pigments also come already suspended. You just need to give these a good shake and they are ready to use.

Small plastic pipettes are brilliant for adding colour to soap. Or you can use drops from a spoon. For micas, you will need to add a lot more than for pigments. For all these colours, you just add the required amount at trace.

Look out for our upcoming Guides on Colouring your soap and Fragrancing your soap.



## Further Information

If you would like to learn more about making soap, you can follow Hazelrock House on Facebook, Instagram, YouTube and Pinterest.

<https://www.facebook.com/hazelrockhouse/>

<https://www.instagram.com/hazelrockhouse/>

<https://www.youtube.com/channel/UCteKQq-fTcsWK2rr2h5Q17A>

<https://www.pinterest.ie/hazelrockhouse/>

I will be continuing to post helpful information on the blog. If you have subscribed to be a 'Housemate' I'll give you a shout when new posts and projects happen and a lot more besides.

If you are having trouble with anything that you have read about in this guide I would be happy to answer your questions. Just email me at [hazelrockhouse@gmail.com](mailto:hazelrockhouse@gmail.com) or post your question on the Facebook page.

I would encourage you to keep being curious about soap making. There is so much information out there but some is not reliable so please just ask if you need help.

Good luck with your soapmaking journey. I hope I can serve you in your quest for knowledge!

*Emma x*