Module 6

TEMPERING CHOCOLATE

6.1 Tempering 101

What Exactly Is Tempered Chocolate?

Tempered chocolate is real chocolate (not “compound” or fake chocolate) that has been treated in a specific way, so that the crystals in the cacao butter set in a perfect formation.

The fats in cacao butter crystallize into 6 different forms. When we temper chocolate, we want the 4th and 5th forms to be present, which are the ones that will give it a shiny look and its particular snap. If cacao is just melted without tempering, the result is unsatisfactory, because all 6 forms are present.

Tempering chocolate ensures that the chocolate sets firmly, snaps, and has a glossy shine. Chocolate that has not been tempered properly will have a “bloom,” be grayish in color, and sometimes have a soft or waxy mouthfeel.

Remember that it is only necessary to temper chocolate if you are making bars, bonbons or enrobing; you do not need to temper chocolate for fudges or ganaches.

Humidity can prevent the chocolate from tempering properly. For this reason it’s very important that all your tools are perfectly clean and dry before you start the tempering process.

Untempered & “Fake” Chocolate

Have you ever purchased a bar of “chocolate” from a store, only to find it crumbly and fudgy? This is an example of bogus chocolate pretending to be real chocolate, and it is generally a way for chocolate companies to avoid the tempering process, or to replace cacao paste or butter with cheaper ingredients. These chocolates are called “compound chocolate” and are not strictly speaking, chocolate - they are just an amalgamation of chocolate elements. For example, there are bars on the market which contain palm or coconut oil instead of cacao butter, or a mixture of carob and cacao powder.

Methods of Tempering

Tempering is a process that consists of melting, cooling, and reheating chocolate within a certain range of temperatures, so that after the breakage and recrystallization of its molecules, a bright, crunchy and easily removable final product is obtained. Depending on whether it’s dark, milk or white chocolate, the temperatures necessary to achieve the desired result vary in the following ways:

	Dark Chocolate	Milk Chocolate	White Chocolate
PHASE 1	↥ 46 °C (115 °F)	↥ 46 °C (115 °F)	↥ 46 °C (115 °F)
PHASE 2	↧ 28 °C (82 °F)	↧ 27 °C (81 °F)	↧ 27 °C (81 °F)
PHASE 3	↥ 32 °C (90 °F)	↥ 30-31 °C (86-88 °F)	↥ 30-31 °C (86-88 °F)

There are multiple ways to temper chocolate. The two best known are the table method and the seeding method. Less common alternatives employ a dehydrator or a high-speed blender.

1. Seeding Method

This is the recommended method for tempering chocolate at home. It consists of adding small pieces of already tempered chocolate (known as the seed) once the mixtures reaches 46 °C (115 °F), to help the temperature drop to 28 °C (82° F).

If you don't have pre-tempered chocolate, you can use a few small pieces of cacao paste or butter from the recipe.

In the dark chocolate recipe for this course, I use maple syrup as a sweetener, and I add it to the mixture when it reaches 46 °C (115 °F) to help it cool down (I will explain this in more depth in lesson 6.4).

Once the chocolate cools down to 28 °C (82 °F), you must reheat it to 32 °C (90 °F).

2. The Table or Marble Method

This is a beautiful technique (although slightly impractical for home cooks!) that is very classic but requires some practice to master. It consists of melting your chocolate to 46 °C (115 °F). Once melted, you pour out about ⅔ of the chocolate onto a marble slab and spread it with a scraper or an offset spatula. You will need to work quickly, using the scraper to fold the chocolate back in on itself, until it cools down and starts to thicken.

Once the desired temperature is reached, you pour it back into the mold with the rest of the chocolate and mix them up. When your thermometer displays 28 °C (82 °F), you just have to reheat it until it reaches 32 °C (90 °F).

Throughout the course, we will use the seed method to temper our dark chocolate.

What tools are needed?

To temper chocolate you will need:

→ A saucepan or medium pot
→ A silicone or glass bowl
→ A rubber spatula
→ A kitchen thermometer
→ High-speed blender (for milk and white chocolate)

How to temper chocolate that has already been tempered?

You don't need to repeat the whole process. If your chocolate has been perfectly tempered, you can simply melt it, just taking care that it does not go above 32 °C (90 °F).

How to calculate the percentage of a chocolate bar?

*** Formula:**

Cacao weight (paste + butter) / Total weight of the recipe

For example, our dark chocolate recipe has the following ingredients:
→ *160 g raw cacao paste*
→ *110 g raw cacao butter*
→ *60 g maple syrup*
→ *6 g (1 tsp) vanilla extract*
→ *3 g (scant ½ tsp) pink Himalayan salt*

Cacao content = cacao paste grams + cacao butter grams = 160 + 110 = **270 g**

Total weight = 160 + 110 + 60 + 6 + 3 = **339 g**

270 / 339 = 0.796 = 0.8 → The chocolate contains **80 % cacao**

6.2 Notes on Ingredient Selection

Use of Nut Butters

In white- and milk-chocolate recipes, instead of powdered milk I use nut butter (homemade, blended from macadamia nuts or cashews). Remember: the butter should be as smooth as possible, so that the resulting chocolate is not grainy and melts in the mouth.

An alternative is to use (alone or in combination with butter) powdered vegetable milk (e.g. coconut). If you choose this option, make sure that the powdered vegetable milk does not contain maltodextrin, an ingredient present in many brands.

Choice of Sugar

Commercial chocolates usually contain refined sugar, while raw chocolate brands often contain coconut sugar. Both are granulated sugars. The reason for using dry instead of liquid sweeteners is to ensure a more stable tempering, which means that chocolates can be transported and stored at room temperature.

Commercial chocolate is made in industrial (or stone) mills, in which the chocolate is subjected to a long friction process in order to obtain an extremely silky texture.

With homemade chocolate, this optimal result is not possible. Coconut sugar simply does not dissolve completely during the tempering process, which makes the end result slightly grainy. To prevent that effect if you wish, you can use maple syrup (or butter), which results in a shiny, silky and delicate chocolate. Keep in mind that for optimal preservation, particularly during warmer months, chocolates (especially white) made with maple syrup should be stored in the fridge.

After many tests, I've obtained the best results in terms of taste, texture and appearance using maple syrup for dark chocolate, maple sugar (or powdered coconut sugar) for milk chocolate and maple butter for white chocolate.

Use of Superfoods

You can increase the nutritional content of your chocolate by adding a superfood. Lucuma is naturally sweet and light in color, and it's a good option for white chocolate because it allows you to reduce the amount of sweetener. Another alternative is to flavor your milk chocolate with maca or mesquite.

Vanilla

You can use vanilla powder, paste or vanilla extract, or the seeds taken directly from the pod. My choice is to use a pure vanilla extract without any added sugar. I avoid using vanilla paste because it usually contains added sugars or syrups.

Seeds provide more flavor and aroma, especially for white chocolate, but they leave tiny black dots in the final product and seeds may sink to the bottom of your chocolate.

6.3 White Chocolate

Before you begin, first read the lesson from start to finish and watch the two corresponding videos. In this session you will be making two different white chocolate bars: one adding some of the toppings I suggest, and another choosing the ones you prefer.

We start off with a recipe that is far from commercial white chocolate. If you look at the label of a high-quality white chocolate, these are the ingredients (listed from the highest to lowest amount): sugar, milk powder, cacao butter, lecithin and vanilla. If it is a low- quality chocolate, the amount of sugar will be much greater, and instead of cacao butter it will contain vegetable oils.

The way to know if a white chocolate bar is of good quality is to determine its cacao butter content. The more butter, the less sugar, and therefore the higher the quality. Save for a few raw chocolate brands that employ quality ingredients, it is very difficult to find healthy white chocolates on the market. The recipe I suggest below contains 50 % cacao butter.

I've chosen maple butter as a sweetener because it is thick and silky, and it also has a very delicate caramel flavor that goes perfectly with white chocolate. You can use maple syrup as an alternative.

6.3.1 Tempered White Chocolate

Ingredients

- 70 g raw cacao butter
- 30 g raw macadamia butter (or cashew butter)
- 30 g maple butter (or maple syrup)
- ½ tsp pure vanilla extract
- ½ tsp lucuma powder
- ⅛ tsp pink Himalayan salt

Method

1. Prepare a small saucepan and pour about 2 to 3 fingers of water. Fit a silicone or glass bowl into the saucepan.

It's very important that the bowl fits the saucepan exactly. The bottom of the bowl must not touch the water. This will also prevent condensed water from coming in contact with the chocolate.

2. Weigh the cacao butter and add it to the bowl along with the salt.
3. Heat the water until it starts to boil. Then reduce the heat to a simmer. It is very important to prevent the chocolate from coming in contact with the steam.
4. Stir occasionally, making sure the temperature never exceeds 46 °C (115 °F). Once the butter is almost fully melted and the thermometer reads 46 °C (115 °F), take the bowl off the heat, dry its bottom with a towel, and pour the liquid butter into the blender jar.
5. Add the rest of the ingredients and blend for about 10-15 seconds until well incorporated.
6. Pour the smooth mixture back into the bowl and stir until the temperature drops to 27 °C (81 °F).
7. When you reach that temperature, place the bowl immediately back on top of the sauce pan and reheat again until the mixture reaches 30-31 °C (86-88 °F).
8. The chocolate is now tempered and ready to use!

6.3.2 Gourmet White Chocolate Bars

Method

1. Make sure your chosen molds are perfectly clean and dry. Place them on a flat tray, to prevent the chocolate from spilling out.
2. If you have just one mold, prepare a tray lined with parchment paper to make a bark (I show you this simple process in the video).
3. Make sure you have enough available space in the fridge to fit the tray so it can be perfectly flat.
4. Pour the tempered white chocolate over the molds.
5. Double tap the tray firmly on the counter to get rid of any air bubbles.
6. Store in the fridge for 5 minutes so it can start to set.

7. Remove the tray from the fridge and decorate the surface of each bar with your chosen toppings.

The reason we let the molds cool down for 5 minutes is to make sure the bars solidify just enough so that when we decorate them, the toppings do not sink into the chocolate and remain in place on the surface.

8. Place the tray again in the fridge until the chocolate has completely solidified. Around 15 minutes will be enough for a very thin bark, but bars may need at least half an hour to set.

1 month in the fridge
and up to 2 months in the freezer

Toppings I've chosen:

→ Black and white sesame seeds, toasted
→ Freeze-dried raspberries
→ Maldon sea-salt flakes

11 **Send us a picture with the final result and a short video of you "snapping" your bar or bark. Let us know which decorations you have chosen and why. Be creative!**

6.4 Milk Chocolate

Before you start, first read the whole lesson carefully and check the videos. To make these delicious bars, begin by caramelizing some pecan nuts. You can do this the day before if you wish. Once your nuts are ready, you can start to temper your milk chocolate and make your bars.

6.4.1 Tempered Milk Chocolate

Ingredients

RAW

→ 60 g raw cacao butter
→ 2 Tbsp coconut sugar (powdered) or maple sugar
→ 1 Tbsp cashew butter
→ 10 g raw cacao paste
→ 10 g raw cacao powder
→ ¼ tsp pure vanilla extract
→ ¼ tsp pink Himalayan salt

Method

1. Start by preparing your *mise en place*.
2. Blend your coconut or maple sugar into a fine powder.
3. Prepare a small saucepan with a little bit of water and a silicone or glass bowl. Place the cacao butter, paste, and salt in the bowl. Set the saucepan over medium-high heat until it reaches 46 °C (115 °F).
4. Remove from the heat and pour into the jar of your blender along with the remaining ingredients.

5. Blend the mixture for about 10 seconds until smooth, then transfer to the same bowl in which you just melted the paste and cacao butter.
6. Stir with a spatula to help the mixture cool down to 28 °C (84 °F).
7. Once the mixture reaches temperature, place the bowl over the saucepan again and reheat for a couple of minutes until the chocolate reaches 31 °C (88 °F).
8. Your milk chocolate is now tempered!

6.4.2 Milk Chocolate & Pecan Bars

Ingredients

- ½ cup pecan nuts
- 2 Tbsp coconut sugar
- 2 Tbsp maple syrup
- 2 Tbsp water
- ½ tsp pure vanilla extract
- A pinch of Maldon sea-salt flakes

Method

1. Begin by adding the coconut sugar, maple syrup, water and vanilla to a non-stick pan, and start cooking over medium-high heat.
2. Once the mixture starts to boil, add the pecan nuts and reduce the heat.
3. Let the caramel reduce over low heat, stirring from time to time with a spatula or a wooden spoon to keep the nuts from sticking to the bottom of the pan.
4. After 10 minutes, you will see the syrup start to become a thick caramel. Add a pinch of Maldon sea-salt flakes and remove from the heat.
5. Place the candied pecans over a tray lined with baking paper and spread them well with a spatula. Allow them to cool down completely. You can place them in the fridge for 5 minutes to speed up the process.
6. Once they are solidified, remove the candied pecans from the fridge and keep them at room temperature.
7. Prepare a flat tray with a silicone bar mold.
8. Place 3 candied nuts in each cavity, then pour in the tempered milk chocolate, making sure you fill them completely up to the edge.
9. Tap firmly on the counter to eliminate air bubbles. Place the tray and molds in the fridge for an hour until the chocolate solidifies completely.
10. Unmold the bars one by one. Decorate each with a candied pecan on top and a pinch of Maldon sea-salt flakes.
11. Enjoy!

Up to 1 month in the fridge and 2 months in the freezer

12 **Follow the recipe and make these beautiful and delicious bars. Upload a picture and don't forget to cut one in half so we can see how it looks inside. Try one and tell us how the texture of your chocolate feels in your mouth. Would you change the sweetener? Why?**

6.5 Dark Chocolate

After working with white and milk chocolate, it is time for dark chocolate: the quintessential chocolate and the one most commonly used in chocolate confections.

As previously explained, the purity of chocolate is determined by its percentage of cacao. The higher the cacao content, the more bitter and richer the flavor of the chocolate.

My recipe is 80 % cacao. We will use this chocolate to prepare bonbons, enrobe truffles and cover pralines and caramel bars.

Ingredients RAW

- 160 g raw cacao paste
- 110 g raw cacao butter
- 60 ml maple syrup
- 1 tsp pure vanilla extract
- ½ tsp pink Himalayan salt

Method

1. Prepare a small saucepan and pour about 2 to 3 fingers of water. Fit a silicone or glass bowl into the saucepan. Make sure the fit is tight, so that no steam comes in contact with the chocolate.
2. Once the water starts to boil, reduce the heat to a simmer.
3. Pour the cacao paste and butter with the salt into the bowl. Let it melt slowly, stirring occasionally with a spatula.

The base of the bowl must never come in direct contact with the hot water, as this will overheat the chocolate. If the bottom of the bowl touches the water, remove some water from the pan.

4. Keep an eye on the thermometer and make sure it does not exceed 46 °C (115 ° F).
5. Once this temperature is reached, remove from the heat, and add the maple syrup and vanilla.
6. Stir with a spatula until the temperature reaches 28 °C (82 °F). This process can take a while, especially if your kitchen temperature exceeds 20 °C (68 °F).

To help the chocolate temper, we add what is called "the seed." These are small pieces of previously tempered chocolate added to the mixture to accelerate the tempering process. If you don't have previously tempered chocolate, you can add a few pieces of cacao butter instead. The pieces must be very small so that they melt easily, with no lumps. Another option is to add a big seed, and then remove it once the temperature reaches 28 °C (82 °F).

7. Once the thermometer displays 28 °C (82 °F), transfer the bowl back over the saucepan and reheat until temperature rises to 32 °C (90 °F). This process will be very fast, so keep an eye on it!
8. Make sure there is no unmelted seed left. Remove any remaining seed, if any, and save it for next time.
9. Your tempered chocolate is now ready!

Properly wrapped, it lasts for up to 1 year in a dry and cool place in the pantry, protected from direct sunlight. If necessary, it can be stored in the refrigerator inside an air-tight container.

13 **Temper your dark chocolate following the recipe and pour it into your silicone molds to make bars. Do not add any toppings because you will use this chocolate in future recipes. Cover the molds and place them in the fridge for approximately one hour until the chocolate has completely set. Once they have solidified, wrap your bars with parchment paper and store them in the fridge inside an air-tight container.**

Upload a picture where we can clearly see the texture of your chocolate and a short video of you "snapping" one of your bars (it's important that we can make sure your chocolate snaps and has tempered correctly).

Try a bite and share your thoughts with us. How do you find the saltiness of it? Would you add more or less salt? Is it sweet enough? Can you taste the vanilla flavor?

NOTES

After many tests, in the end I settled on maple syrup as a sweetener because it yielded the most delicious dark chocolate. These are the results I obtained using other sweeteners:

- **Powdered coconut sugar:** The result is a crunchy chocolate with a subtle caramel flavor. Even after powdering, I found the texture to be slightly grainy. It's delicious and I invite you to give it a try. Remember to add the powdered sugar in the beginning, along with the cacao butter and paste so that it has more time to dissolve while the cacao melts.
- **Coconut nectar:** It has a lovely flavor but is sweeter than maple syrup, so you have to use less of it.
- **Date sugar:** This type of sugar doesn't give a lot of flavor and results in a slightly gritty chocolate.
- **Monk fruit:** Gives chocolate a particular flavor and a slightly grainy texture. I recommend that you try it in a small batch, so you can test it.