

# Vanilla Ice Cream Base!

## Equipment:

- 1 large stock pot, preferably heavy bottomed.
- 1 small bowl for separating egg yolks and whites.
- 1 small bowl for saving egg whites in.
- 1 large mixing bowl for mixing egg yolks, sugar, milk, cream, and vanilla.
- 1 instant read thermometer, preferably digital and with a long cord.
- 1 ice cream maker - any kind will do, I really like the ones that you can leave in the freezer that are small and battery powered, but even the old fashioned hand crank ones are just fine!
- 1 big bag of ice, if you're using an old fashioned ice cream maker.
- A lot of rock salt, if you're using an old fashioned ice cream maker.

## Ingredients:

- 12 eggs (yolks only!)
- 1 quart of milk
- 1 pint of cream
- 1 cup of sugar
- 1 teaspoon of vanilla extract

1.) First, get out your equipment and ingredients! Put the **two small bowls** and the **large mixing bowl** in front of you. Take your **eggs, cream,** and **milk** out of the refrigerator. Begin by **cracking your eggs** into one of the small bowls, one by one, **separating the yolk from the white** by gently lifting the yolk up in your hand and letting the white fall between your fingers. Once you have the yolk by itself, put it into the large mixing bowl, and pour the white into the bowl that you're using to save the whites for another purpose.

2.) Once you are finished separating all twelve eggs, carefully measure out one cup of **sugar**, and add it to your egg yolks. Take a wire whisk, and **stir until the egg yolks and the sugar are combined** - it should only take a little while, watch for any graininess to disappear, and for the yolks to lighten in color a little.

*Although some people claim that there's a difference in ice cream where the yolks are creamed with the sugar, the reason we mix these two things first is because it's the easiest way to dissolve the sugar.*

3.) Next, **measure out your milk**, and slowly add it to your mixture while **stirring it in gently** with the whisk. Then do the same for the **cream**. There should be no streaks, it should all be one homogeneous mixture. Finally, **add your vanilla extract**, and mix it in completely.

4.) Now what you have in front of you is a raw ice cream mixture (don't taste it yet, since raw eggs are unsafe). So now we cook it!

**Fun with food science:** *Cooking the mixture causes the proteins in the egg yolks to denature and coagulate. **Denaturation** is when proteins unravel and lengthen out. **Coagulation** is when 'dispersed colloidal particles agglomerate'. What does this complicated stuff mean? Well, the proteins in the eggs unravel from little balls into long strands, and no longer can move freely by each other, creating tiny webs that trap liquid from the milk and cream to create a thick milk gel - also known as a **custard!** Because a custard is more **viscous**, or thicker, than plain milk and cream, it will give us a richer, denser ice cream.*

Before or during cooking, prepare an **ice bath** in your sink, by filling your sink with some ice and water. **Heat the custard** over medium-low heat, **stirring gently but constantly**. *It's important to firmly wipe the entire bottom and all of the edges of your stockpot, or the custard can stick and then burn.* Heat your custard until it thickens a bit and is at just below a simmer, or to 175 degrees Fahrenheit. *(Letting it get any hotter will give you something a little too much like scrambled eggs!)* Using hot pads, immediately **put your stock pot into the ice bath**, and **stir rapidly** until the temperature has dropped to 120 degrees. Then leave your ice cream base to sit until it has chilled to room temperature, between 50 and 70 degrees, colder being better. The longer you stir, the faster it will cool.

5.) Freeze according to the instructions on your **home ice cream maker**. In this class, we'll be using an old fashioned hand crank style ice cream machine with a modern twist - it has a motor, and you don't need to crank it! These types of ice cream machines require ice and rock salt to freeze the ice cream.

**Fun with food science:** *The rock salt is used to make the ice colder. Believe it or not, salting ice lowers its temperature. Crystalline rock salt and crystalline ice begin to disrupt each others' crystal structures, causing the ice to melt. This melting requires energy, which is extracted from the ice as it melts, lowering the temperature.*

Note: If you want to use vanilla beans, cut the pods in half and scrape the seeds out with the back of a knife, then throw the whole bean pod and the seeds into your ice cream base before heating it, and leave them in while cooking. Take out the vanilla bean pod pieces before you put the base into your ice cream mixture.

Note: You can scale this recipe to any size you want. Just remember that if you have more of it, it will take longer to heat and cool your ice cream base!