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Glue this section into lapbook.

# AIR:

## What does it do?



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It is a really hot day and you have decided you want to test the recipe for Vanilla Ice Cream Thomas Jefferson brought to the US from France in 1780. You open the refrigerator and reach for the cream and eggs. You already have the sugar waiting in a saucepan.

After you carefully separate the egg yolks from the whites, you add the yolks and the cream to the sauce pan. You have an

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adult help you to carefully heat the mixture on the stove to kill the bacteria from the raw egg yolk.

When you have finished heating the mixture, you add the vanilla, pour it in a bowl, and allow it to cool. Once it is cool, you place it in the freezer and prepare to wait a few hours for your homemade ice cream treat!

Five hours later you run back to the freezer, throw open the door, and grab the bowl. You are so excited you can

hardly stand it!

It has been hard work waiting patiently all those hours! You have a newfound respect for Thomas Jefferson! After all, he had to wait for his ice cream, too.

You place the bowl on the counter and grab a spoon. As you try to dive into your homemade treat you quickly realize that instead of smooth, creamy ice cream you have a yellowish-bowl-shaped-vanilla-flavored-milky-ice-mold...

What happened? What went wrong?

Let's start at the beginning. When you began to mix all the ingredients together you were on the right track. And when you put the mixture in the freezer, you had the right idea, too.

In fact, if you would have checked on it earlier it would have been slushy. But why didn't it ever get creamy?

To answer that question you need to know two important secrets to making creamy ice

cream. One is constant mixing and the other is air. Put the two together and your ice cream will have less ice and more cream! Here is why:

The mixing process breaks the ice into millions of tiny crystals as it begins to freeze. This makes sure our mixture freezes into ice cream and not a yellowish-bowl-shaped-vanilla-flavored-milky-ice-mold.

The air also helps to make our ice cream smooth and creamy by stirring tiny air bubbles into the mixture.

We mostly see this with commercial ice cream made in large factories. As the ice cream mixture freezes the mixing paddles trap bubbles. These bubbles add air, called the overrun, which doubles the volume of the ice cream mix. So two cups of ice cream mix would make four cups of creamy ice cream!



### Major Parts of the Hand Crank Ice Cream Maker

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How does the hand crank machine help to make ice cream creamy?

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How does the factory ice cream machine help to make ice cream creamy?

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