

# Food Science for the Win

## Simple Grilled Cheese

### Resource Guide



The kitchen is an ideal lab for experimenting and being curious while embracing your inner scientist. Explore the science of making a simple grilled cheese sandwich.

## Basic Concepts

- **Emulsion:** Combination of fat and water from cheese that results in gooey, creamy melting when heated.
- **Emulsifying salt:** Ingredient that is added to cheese with poor melting properties to increase melting by retaining the emulsion between fat and water in cheese. Sodium citrate is a common emulsifying salt.
- **Maillard reaction:** Chemical reaction between amino acids and sugars resulting in browning and complex flavor development. Takes place above 350° F.

## Basic Equipment

- **Frying pan:** Flat-bottomed pan used for stovetop cooking like frying, browning, and searing. Pans are made from a variety of materials including stainless steel, cast iron, copper, and ceramic. Nonstick finishings are best for grilled cheese sandwiches.
- **Turner spatula:** Cooking utensil with a flat rectangular shape extended from a handle used to flip the grilled cheese sandwich. Can be made of rubber or metal, and the material you use should be compatible with your frying pan. For example, a metal turner spatula can be used with a cast iron skillet but not a ceramic pan.

## Basic Techniques

- **Buttering** the pan or bread provides the foundation for toasting. Low and slow is recommended so as not to burn the butter. Note: cold butter will not spread well on room temperature bread.
- **Heating** or grilling the composed sandwich on a frying pan or griddle induces the Maillard Reaction, causing browning of the bread and melting of the cheese.

## Suggested Resources

- ***Salt, Fat, Acid, Heat: Mastering the Elements of Good Cooking* by Samin Nosrat and art by Wendy MacNaughton:** This beautifully written and illustrated cookbook walks you through mastering the four basics of cooking: salt, fat, acid, and heat. The eBook is available on [OverDrive](#).
- ***Grilled Cheese, Please!* by Laura Werlin:** Ready to go beyond the traditional grilled cheese? This book offers 50 different recipes for you to try out and experiment with. Place a hold through [our catalog](#).
- ***Good Grilled Cheese* ([video](#)) from Kenji's Cooking Show by J. Kenji López-Alt:** This video uses a point of view camera to show how to make a really good grilled cheese with basic ingredients: butter, bread, and cheese slices.
- **"The Best Cheeses for Grilled Cheese" ([link](#)) from HuffPost:** A cookbook author, an executive chef, and a food educator each share their top cheeses for grilled cheese sandwiches.