

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.