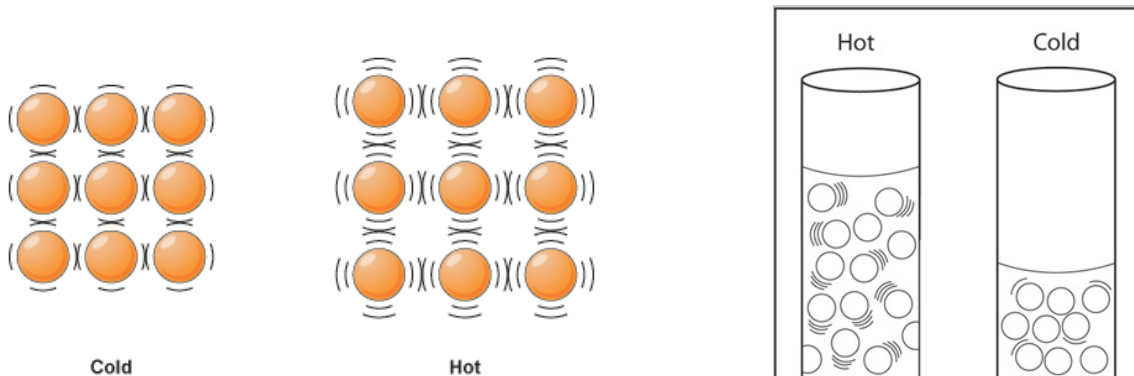


# How Heat Works

So how exactly does cooking work? What happens to food when it is placed over a hot fire or other cooking equipment?

A brief history shows that civilization (people living with each other in groups) really started happening after fire was discovered. Cooking made food easier to digest, especially meats. Cooking also made food tender, so eating was no longer an all-day activity. This “extra” time could be used to hunt, to explore, and to build.

Few of us actually understand what happens to food when it is heated. Heat is a form of energy. The term is used to be the speed of molecules. Molecules moving slowly, would suggest cold. Fast moving molecules suggests heat is present.



The higher the temperature the faster the molecules are moving.

In order for this heat to be transferred from one substance into another, causing them to pick up speed. The metal atoms in a hot skillet are bumping into the slow moving molecules in the food causing them to speed up.

A wide range of changes occur when molecules are speeded up. The food can change colors, both by gases driven by hot foods and heat made chemical reactions. Water trapped between molecules are freed and food can lose moisture. Cell walls that give raw foods their integrity can break down making foods more tender. Different changes are different in each food. The heat level and type of heat and how long is important.

Heat makes food taste better, but it can also spoil the taste of food when food is burnt. When food is burnt it becomes bitter.

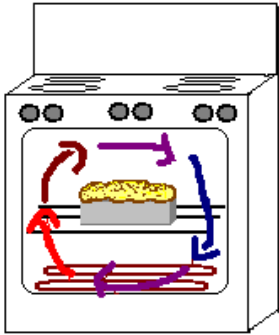
Here are several terms that describe different types of heat:

Convection, conduction and radiant

Most cooking methods, such as roasting and grilling, are a combination of heating methods. For instance, a roast that is placed in a metal pan in the oven, is being cooked by conduction as well as by convection. Conduction is heat transferred molecule by molecule. Convection is heat transferred by the hot air from the oven to the food. Radiant heat is the heat emitted by the heating element in the oven and is absorbed by the food.

# How Heat Works

## Convection in an Oven



**Heated Air molecules spread out and rise**  
**They rise and cool slightly as they go away from the source of the heat**  
**They cool further as they reach air of the same density. They begin to become more dense than the surrounding air**  
**The air cools sufficiently so that it is more dense than the surrounding air and falls**  
**The air is heated by the coils and starts to spread out again**

Convection is heat flow through materials

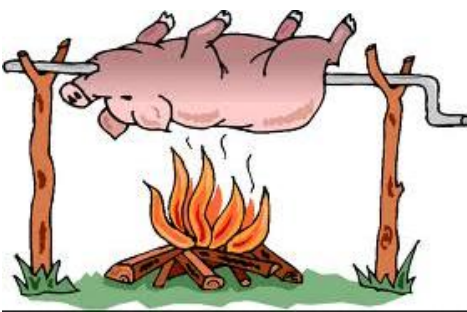
## Convection



## Conduction Cooking



## Radiant:



## Broiling

- It uses radiant heat from an overhead source to cook food.

**Broiler** - Heat from above.



**Grill** - Heat from below.

