



Introduction to Cooking with Gas

Lesson 5: Griddling

ADVANCED



Introduction

Welcome to Introduction to Cooking with Gas. Today's topic is the proper operation of equipment to reduce gas usage and bills. Once you learn about proper operation of your equipment, you will learn how to cook with gas to make your own simple or fancy French toast.

This lesson can be completed in a classroom or at home. Your teacher will provide instructions for completing the assignment from home.

Opening Assessment

1. Which of the following would be a good way to save money on energy bills?
 - a. only cook enough food for one meal
 - b. preheat oven before starting food prep
 - c. use a small burner for a small pot
 - d. cook foods at a low temperature
2. What does the transfer of heat by conduction require?
 - a. direct contact with a hot surface
 - b. absorbance of electromagnetic waves
 - c. circulation of air around a surface
 - d. indirect exposure to a heat source
3. What type of cooking uses fat or oil for the transfer of heat?
 - a. grilling
 - b. broiling
 - c. griddling
 - d. baking
4. Which of these foods would be cooked on a griddle?
 - a. stew
 - b. pasta
 - c. bacon
 - d. rice
5. Which kind of cooking equipment is the most energy-efficient?
 - a. convection oven
 - b. barbecue grill
 - c. rangetop burner
 - d. oven broiler

Proper Operation of Equipment to Reduce Gas Usage and Bills

Energy efficient cooking is the key to keeping energy costs down in both a home or commercial kitchen. Energy Star® appliances are engineered to use less energy, independent of how the cook operates the equipment. A standard gas oven has a 30% rate of efficiency, while an Energy Star gas oven has a rate of 44%. Energy Star appliances can be more expensive than standard equipment, but the efficiency rating saves on utility usage resulting in lower operating cost.

Even without the most up-to-date engineering, the proper operation of cooking equipment can reduce energy costs. Anything a cook can do to increase useful energy in relation to total energy will save money. For example, while using a griddle, only heat the amount of the grill plate as needed.

Cooking with Natural Gas

The best way to reduce energy waste when using any piece of kitchen equipment, whether at home or in a commercial kitchen, is proper timing of the cooking process. In a commercial setting, refer to the preheating time of a griddle per the manufacturer's recommendation prior to opening or service. Many griddles are available with digital screens so that the griddle plate temperature is displayed. Other methods are using a griddle thermometer or purchasing a griddle with thermostatic controls.

In a commercial kitchen, just as in a home kitchen, energy can be saved by proper timing of the start-up and shut-down of equipment. Most commercial cooking equipment requires only 15 minutes to preheat, so it is not necessary to turn equipment on early in the morning for service at lunchtime. During slow business hours, such as between lunch and dinner service, turning equipment off will save energy. Shutting equipment down immediately after service is as important in a restaurant as it is at home. Some restaurants institute a start-up and shut-down schedule that reminds staff when to turn equipment on and off.

The size, number and design of the burners under the griddle plate will affect energy usage and savings. The amount of food placed on the griddle, spacing of the food, its thinness or thickness and many other factors will effect heat penetration, browning/ caramelization and internal temperature.

Keeping equipment clean is also important. Proper cleaning procedures and maintenance of the griddle plate are outlined by the manufacturer. Refer to those instructions to maintain and extend the life of the griddle. Never use ice; it will damage the plate, cause cracking and warping and will void the warranty.

Cooking Methods

There are three types of cooking methods that utilize natural gas:

1. **Moist cooking** involves cooking with moisture in either liquid or steam form.
2. **Dry cooking** involves cooking without any moisture.
3. **Combination cooking** combines moist and dry heat cooking.

Today, you will be learning about and preparing food using a dry cooking method.

Dry Cooking: Griddling

Dry cooking methods include broiling, grilling, griddling, roasting, baking, sautéing and deep frying. Some of these methods utilize a fat such as butter, margarine or oil in order to cook the food, but some of these methods are very dry and simply rely on a source of heat and the fat content within the food itself. With or without the help of added fat, the heat source in dry cooking acts directly on the surface that holds the food. In grilling, griddling and sautéing, the heat comes from below; in broiling, the heat comes from above; and in roasting, baking and deep frying, the heat comes from all around the food.

This lesson will utilize a griddle or griddle pan and the dry cooking method. A griddle is a smooth, flat surface made of metals that are good heat conductors, such as steel, chrome or aluminum. Natural gas griddles are often preferred because they can achieve temperatures and recover more quickly than non-natural gas alternatives. Because foods cooked on a griddle have contact with the heated surface only on one side at a time, foods must be turned over to cook thoroughly and evenly without too much browning or caramelization on one side or the other. Browning is often referred to as caramelization because the fat on the griddle or in the food reacts to the heating surface.

The cooking area on a griddle is called the plate. The plate is a slab of metal of uniform thickness, but plates come in different thicknesses, usually from ½ to 1 inch, depending on the



A gas griddle in a commercial kitchen

type of food being cooked. The heat from the burners below the plate diffuses through the plate to the surface where the cooking is done. Thicker plates may take longer to heat up, but they store heat better and are preferred for cooking meats and frozen items. Thinner plates are better for more delicate items like eggs. Commercial griddles also require an exhaust hood overhead to remove radiated heat, smoke, steam and airborne particles of grease rising from the griddle surface during cooking.

In a commercial kitchen a griddle will most often be made of steel, which is the most affordable metal, and must be large enough to cook a lot of food at the same time. It can be a self-contained unit with legs, it can sit on top of a counter, or it can be dropped into an opening in a counter in the cookline.

Gas griddle temperature controls are similar to those on a gas range at home, with separate knobs controlling separate burners located under the plate. Some griddles are manually controlled, with the line cook lowering and raising the heat across a range of low, medium and high. This does not allow for precise control of temperature at the cooking surface, which typically requires a range of 200° to 550° to cook a variety of foods. Other commercial griddles have controls that allow the line cook to set the temperature of the griddle surface directly over each individual burner. A large commercial gas griddle with individually controlled burners can maintain different cooking zones for different kinds of foods, and some of its burners can be shut off when business is slow.

The griddle is a busy station in any restaurant because of the popularity of griddled foods such as eggs, bacon, pancakes and burgers. Griddles are often used for browning the surface of a food while also warming the inside. This can apply to steaks as well as sandwiches. If you cut into a steak that has been cooked rare on a griddle, the center of the steak will remain red and stay cool, while the outer layers will turn brown and feel hotter to the touch. Browning is a chemical reaction that occurs when sugar and amino acids, or proteins, form a compound when exposed to high temperatures. Searing at a high temperature is a more intense browning technique used for meats to seal the juices inside. Browning, taken too far, is called burning!



Browning and searing create food debris during cooking. Regularly scraping the griddle plate is recommended to eliminate excessive piling up and burning of food debris. Cleaning a griddle at the close of service involves shutting down the heat and waiting for the temperature to decrease, spreading a factory recommended griddle cleaner on the surface (the griddle has splash guards), scraping the surface and treating it with a thin layer of cooking oil.



A large griddle that sits over two burners on a commercial range
Image credit [Meal Makeover Moms](#)

Home cooks rarely need anything as large as a commercial griddle, but home griddles do vary in size. The most commonly used home griddle sits on one burner on a range top, but others may be large enough to fit over two burners or all four burners at once. The smallest griddle for home use is a griddle pan, which looks something like a frying pan but is rectangular instead of round and has a larger flat cooking area than a frying pan because the sides of a griddle pan do not slope as much and are much lower than the sides of a frying pan. Griddle pans can be grooved to create browning in stripes, but for a sandwich, a smooth surface is better. A frying pan can substitute for a smooth griddle pan. If a griddle pan is not available, a frying pan works just as well for smaller food items that cook by

griddling. Larger range-top griddles consist of a piece of flat heat-conductive metal, like the plate on a commercial griddle, but with a handle at either end.

Instructor Demonstration

Watch the instructor demonstration on proper natural gas range safety and how to prepare French toast on a griddle. Answer the following questions as you watch the demonstration.

- What safety tips did the instructor give during the demonstration?
- Was any movement, other than flipping, necessary to cook the French toast?
- How did the instructor demonstrate the flipping technique?
- How did the instructor determine how long to cook the French toast?
- What cooking tips did the instructor give during the demonstration?

Selecting and Preparing a Recipe

The following section can be completed at home if the preparing and cooking can be performed safely. Residential and commercial cooking equipment vary; while the information focuses on natural gas equipment, electric ranges and stoves may also be used to complete the cooking assignment.

Now you are going to make your own French toast using bread, eggs and milk. Once cooked, the French toast should be golden brown and a little crispy around the edges. Toppings can go on top or between the slices of French toast, or both.

Your teacher will review your recipe and dish based on the criteria listed below. If you are learning remotely, your teacher will provide you with instructions on how to submit your recipe and images or video(s) of your completed dish.

Criteria	Excellent 3	Proficient 2	Emerging 1
Procedure	clearly followed given instructions and the example provided in the demonstration	somewhat followed given instructions and/or the example provided in the demonstration	did not follow given instructions and/or the example provided in the demonstration
Content (submitted photos, procedure, videos, etc.)	content and explanations were thorough and well detailed	included content and explanation but included few specific details	included little to no additional content or explanations and/or no specific details
Organization	organized when preparing and making their recipe	somewhat organized when preparing and/or making their recipe	not organized when preparing and/or making their recipe

Create Your Recipe

For this recipe you will need to choose one item from the bread column and one item from the fat column. You can choose to add any additional toppings or flavors based on your preference, dietary restrictions, allergies and available ingredients. Before starting to cook, it is important to have all of your ingredients, tools and equipment prepared ahead of time, what chefs call "mise en place" or "everything in its place."

Select the main ingredients:

Egg or egg substitute

Whole milk or milk substitute

Granulated sugar or sugar substitute, or vanilla extract

Select a type of bread:

1" thick Italian, French or other similar bread

Select a fat:

Cooking spray, vegetable oil or a combination of butter and oil

Select a topping or a combination of toppings:

For classroom cooking: fresh fruit such as bananas, strawberries, blueberries, or peaches; maple syrup; powdered sugar

For home cooking: fresh fruit; applesauce; canned pie filling; jam or jelly; chopped nuts; honey or maple syrup; powdered sugar; whipped cream; spices, such as cinnamon and nutmeg

Safety first:

- Always keep a Class ABC fire extinguisher nearby.
- If you are cooking at home, make sure the burner you choose fits the pan or griddle you are using. Any part of the flame that is exposed creates an increased fire hazard, and it can also heat the handle of the pan.
- Do not allow the handle of the pan to stick out beyond the front of the rangetop where you could accidentally bump into it.
- Never leave any flammable material near the burner flame while you are cooking. Keep unused oven mitts, kitchen towels, or plastic wrap well away from the range. Roll up or avoid long sleeves while cooking. The rangetop should also be clear of other pots and pans, and the nearby countertop clear of anything that is not going to be used in your recipe.
- The cooking surface of a griddle can be very hot, so use oven mitts or potholders to protect your hands.
- Make sure the cheese slices do not extend over the edges of the bread, or the cheese will melt directly onto the pan's surface and burn.
- When flipping food, use a spatula that is large enough for the item you are cooking.
- Never use wet or moist potholders, oven mitts or towels as they will conduct heat, burning your hands.
- Practice knife safety when cutting any ingredients and use properly sharpened knives.

Equipment:

- Seasoned griddle or shallow pan
- Shallow bowl or small baking pan
- Medium-size bowl with steep sides
- Whisk
- Serrated knife
- Spatula

Ingredients:

- 2 eggs (or egg substitute)
- ½ cup whole milk (or almond, soy, or other milk substitute)
- 2 slices Italian, French or other similarly spongy bread, cut ¾- to 1-inch thick
- ½ teaspoon of granulated sugar or vanilla (or equivalent substitutes)
- Choice of fat
- Choice of toppings

NOTE: To make one slice of French toast, use one egg and ¼ cup milk and adjust sugar or vanilla accordingly. If you are using substitutes for any of the ingredients, follow the directions on the packages for equivalent measures.

Procedure:

1. Preheat your griddle or pan to medium heat (see tips).
2. Using the serrated knife, slice your bread. It should be between ¾ and 1 inch thick.
3. Using a whisk, mix the eggs, milk and sugar in a small bowl.
4. When the griddle/pan is preheated, place one slice of bread in the egg mixture. Make sure both sides of the bread are covered in the egg mixture.
5. Place some butter or margarine on the griddle/pan and wait for it to melt.
6. Lay the bread on the griddle/pan.
7. After about 2-3 minutes, lift an edge of the bread to check the browning process. You want a golden brown, not a pallid yellow or a dark brown (unless you like dark brown). Leave on the griddle/pan if you prefer more browning.
8. When one side is golden brown, insert the spatula all the way under the bread and flip it over. Usually, the second side will brown faster.
9. When the other side of the bread is golden brown, remove from the griddle/pan.
10. Top with your favorite toppings and enjoy.

Tips:

- Preheat the griddle or pan for two or three minutes, depending on its thickness. A thicker, heavier pan will take longer to preheat.

Activity

After you complete cooking your French toast, you will write about a cooking experience you have had.

Describe in two paragraphs a personal cooking experience prior to taking this class. For an unsuccessful experience, include whether some of the things you've learned so far may have helped you avoid the problems you encountered. For a successful cooking experience, include whether anything you've learned in class helps you better understand the processes involved in your cooking.

4	3	2	1
<p>The student response ...</p> <ul style="list-style-type: none">• fully responds to each part of the writing prompt with relevant, strong details• has logical organization• uses effective language and word choice for purpose and audience• contains no errors in usage or grammar	<p>The student response ...</p> <ul style="list-style-type: none">• addresses each part of the writing prompt with sufficient details• has sufficient organization• uses mostly effective language and word choice for purpose and audience• contains minor errors in usage or grammar that do not affect meaning	<p>The student response ...</p> <ul style="list-style-type: none">• addresses some of the writing prompt with weak details• attempts organization• uses some language and word choice for purpose and audience• contains minor errors in usage or grammar that slightly affect meaning	<p>The student response ...</p> <ul style="list-style-type: none">• does not address a large portion of the writing prompt• lacks organization• rarely uses appropriate language and word choice for purpose and audience• contains major errors in usage or grammar that greatly affect meaning

Final Assessment

1. Which of the following would be a good way to save money on energy bills?
 - a. only cook enough food for one meal
 - b. preheat oven before starting food prep
 - c. use a small burner for a small pot
 - d. cook all foods at a low temperature
2. What does the transfer of heat by conduction require?
 - a. direct contact with a hot surface
 - b. absorbance of electromagnetic waves
 - c. circulation of air around a surface
 - d. indirect exposure to a heat source
3. What type of cooking uses fat or oil for the transfer of heat?
 - a. grilling
 - b. broiling
 - c. griddling
 - d. baking
4. Which of these foods would be cooked on a griddle?
 - a. stew
 - b. pasta
 - c. bacon
 - d. rice
5. Which kind of cooking equipment is the most energy-efficient?
 - a. convection oven
 - b. barbecue grill
 - c. rangetop burner
 - d. oven broiler

Introduction to Cooking with Gas—Advanced

Lesson 5: Griddling

Teacher Guide

(1 class session)

Introduction

This lesson covers a basic understanding of the proper operation of equipment to reduce gas usage and bills. Then, students will learn how natural gas is used on a griddle or rangetop to griddle, or “shallow fry,” French toast. Keep in mind that students may have dietary preferences, restrictions or allergies that may need to be accommodated in order for them to complete the recipe. Note that students may have different types of appliances at home, such as an electric or induction range, which will not prevent them from completing the assignment. If the student is preparing food at home, ensure that appropriate adult supervision will be available.

This lesson could be completed in a classroom or at home. Suggestions and instructions will be given for both scenarios.

Opening Assessment Answer Key (3 minutes)

Use these questions to obtain a baseline for what your students know before beginning the lesson. The correct answers are highlighted.

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How Does Proper Operation of Equipment Reduce Gas Usage and Bills? (5 minutes)

Students will read about cooking energy efficiency. The following questions could be used for a class discussion or given to students to complete individually.

- Why is energy efficiency important?
- What is cooking energy efficiency?
- What does a convection oven do that promotes cooking energy efficiency?
- How does the type of cooking environment have an impact on efficiency?

Cooking with Natural Gas (5 minutes)

Students will read about how proper operation of equipment can reduce gas usage and bills. The following questions could be used for a class discussion or given to students to complete individually.

- What are some things you should consider when choosing a pot or pan to cook a meal?
- What are some things you should consider when choosing a burner for your cooking job?
- What practices might yield the greatest savings when cooking?

Cooking Methods (2 minutes)

Students will understand that there are three cooking methods that utilize natural gas: moist cooking, dry cooking and combination cooking.

Dry Cooking: Griddling (5 minutes)

Students will read about cooking with dry heat and the griddling technique. The following questions could be used for a class discussion or given to students to complete individually.

- What are the benefits to cooking with dry heat?
- Given what you know about how a griddle works, what foods might not get cooked properly on a griddle?
- What way is sautéing similar to griddling? What ways is it different?
- What other cooking methods create browning?

Instructor Demonstration (7 minutes)

The demonstration can either be performed in class or recorded for remote use. If the demonstration is done in person, preheat the commercial griddle before students come to class and consider whisking the French toast batter and soaking the bread you will use in the batter while the students complete their readings so that you will only need to demonstrate the cooking process, not the prep process. If these things are done in advance, the cooking part of the lesson should take no more than eight minutes. If you have chosen to use fresh fruit as a topping, prep it before students arrive.

Prep extra fruit for students who do not want to use a sweeter topping, but have the standard maple syrup topping available for other students. Other toppings that are included in the ingredient list are choices for students if they are cooking at home; you don't have to provide all of them.

You may also consider prepping enough batter for students as well as for your own demonstration, so that students can soak their bread in the batter while you are demonstrating the cooking method. You may already be aware of the number of students in the class who have food allergies. Prep some batter for these students with the necessary ingredient substitutes.

NOTE: You may need to remind students to turn their bread over in the batter to soak the second side while you are demonstrating.

The demonstration should include:

- how a griddle works
- safety tips when using a griddle
- how you are being energy-efficient while you cook the French toast
- how hot the griddle should be before cooking
- benefits of using griddling as a cooking technique
- proper technique for flipping food on the griddle
- how to check each side of the French toast for doneness

Students will use the following questions as a guide to either a class discussion after the demonstration or note taking during the demonstration:

- What safety tips did the instructor give during the demonstration?
- How high did the instructor have the temperature?
- How did the instructor determine how long to cook the French toast?
- What cooking tips did the instructor give during the demonstration?

Selecting and Preparing a Recipe (15 minutes)

If the students will be cooking in the classroom, ensure the ingredients are available ahead of time. Make sure that student allergies, dietary restrictions and preferences are taken into account. Also, be sure to plan a few minutes at the end of class for cleanup.

If the students are cooking at home, be sure to provide the ingredients or the “mise en place” ahead of time to give the students time to assemble them. Consider the time the recipe typically takes to cook and the ability for students to purchase their ingredients from the grocery store.

Students will use the instructor demonstration as a guide to cook their own French toast. Students will select a bread, fat and optional toppings from a list in order to complete their recipe.

Students cooking at home can submit a description of the ingredients and procedure they used along with pictures of their completed dishes or a video of themselves cooking the recipe. Be sure to share instructions with your students on what to submit and how to share it with you.

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Activity (8 minutes or as homework)

This activity is provided to be used either in the classroom during any down-time, or as homework. In this activity, students will write about a cooking experience they have had.

Describe in two paragraphs a personal experience prior to taking this class. For an unsuccessful experience, include whether some of the things you've learned so far may have helped you avoid the problems you encountered. For a successful cooking experience, include whether anything you've learned in class helps you better understand the processes involved in your cooking.

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Final Assessment: Answer Key (3 minutes or as homework)

Use these questions in conjunction with the discussion questions in each section to formatively assess student growth over the course of the lesson. Address any student misconceptions that remain at the end of the lesson. Consider having students compare their opening assessment with their final assessment to see how their understanding of cooking with gas improved over the course of the lesson.

1. Which of the following would be a good way to save money on energy bills?
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 - c. use a small burner for a small pot
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