



# Intermediate Cooking with Gas

Lesson 6: Sautéing

**BEGINNER**



## Introduction

Welcome to Intermediate Cooking with Gas. Today's topic is sautéing. Once you learn about sautéing, you will learn how to cook with gas to make your own stir-fry with broccoli and protein.

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. What does the French word "sauté" mean in English?
  - a. stirred
  - b. jumped
  - c. tossed
  - d. fried
2. What temperature should the range be set to while stir-frying?
  - a. medium-low
  - b. medium
  - c. medium-high
  - d. high
3. Which is the correct cooking order of vegetables when stir-frying?
  - a. bok choy ⇒ mushrooms ⇒ broccoli
  - b. broccoli ⇒ mushrooms ⇒ bok choy
  - c. mushrooms ⇒ bok choy ⇒ broccoli
  - d. mushrooms ⇒ broccoli ⇒ bok choy
4. What is the type of steel used to make restaurant grade woks?
  - a. alloy steel
  - b. aluminum steel
  - c. carbon steel
  - d. stainless steel
5. What is the term given to preparing a sauté pan or wok for high heat cooking?
  - a. coating
  - b. oiling
  - c. rubbing
  - d. seasoning

# Understanding Your Gas Bill

Understanding what is on your gas bill can help you monitor your gas usage in and outside of the kitchen and find ways to save energy and gas. Below is an example of a gas bill from SoCalGas. Under the gas bill you will find an explanation of each section, from top to bottom.

**SoCalGas** ACCOUNT NUMBER 987 654 3210 3 SERVICE FOR JOHN Q PUBLIC 123 TEST STREET PLACENTIA CA 91870-1234 DATE MAILED Mar 19, 2019 Page 1 of 2 24 Hour Service 1-800-427-2200 English 1-800-342-4545 Español 1-800-252-0259 TDD so cal gas . com H

**Account Summary** You are currently receiving the CARE discount. The discount now appears as a separate credit on your bill.

Amount of Last Bill \$115.70  
Payment Received 03/08/19 THANK YOU - 115.70  
Current Charges + 133.26  
Total Amount Due \$133.26

**Current Charges**

Rate: GR - Residential Climate Zone: 2 Baseline Allowance: 55 Therms  
Meter Number: 67915 (Next scheduled read date Apr 15 2019) Cycle: 10

Billing Period	Days	Meter Number	Current Reading	Previous Reading	Difference	Billing x Factor	BTU x Factor	Total Therms
02/13/19 - 03/15/19	30	13767915	3619	3479	140	0.871	1.028	125

**GAS CHARGES**

Customer Charge 30 Days x \$.16438  
Gas Service (Details below) 125 Therms  
Over Baseline  
Therms used 70  
Rate/Therm \$1.34843  
Charge + \$94.39 = 150.27  
Transportation Charge Adj 125 Therms x \$.00562 - .70  
CARE Program Discount -30.90  
Total Gas Charges \$123.60

**TAXES & FEES ON GAS CHARGES**

	Amount(\$)
State Regulatory Fee 125 Therms x \$.00166	.21
CARE Public Purpose Surcharge 125 Therms x \$.00752	9.45
Total Taxes	9.66
Total Gas Charges	\$133.26

**Gas Usage History (Total Therms used)**

Month	Total Therms used	Daily average Therms	Days in billing cycle
Mar 18	104	3.5	30
Feb 19	109	3.8	29
Mar 19	125	4.2	30

Attractive finance rates are available for home energy improvements. Visit [so cal gas . com / financing](http://so cal gas . com / financing)

PLEASE KEEP THIS PORTION FOR YOUR RECORDS. (FAVOR DE GUARDAR ESTA PARTE PARA SUS PROPIOS REGISTROS.)  
PLEASE RETURN THIS PORTION WITH YOUR PAYMENT. (FAVOR DE DEVOLVER ESTA PARTE CON SU PAGO.)

**SoCalGas** **Save Paper & Postage** ACCOUNT NUMBER 987 654 3210 3 PAY ONLINE [so cal gas . com](http://so cal gas . com)

**DATE DUE Apr 8, 2019**  
**AMOUNT DUE \$133.26**

Please enter amount enclosed.  
\$  
Write account number on check and make payable to SoCalGas.

9999.1.2.2 1 oz.  
JOHN Q PUBLIC  
123 TEST STREET  
PLACENTIA CA 91870-1234

SoCalGas  
PO BOX C  
MONTEREY PARK CA 91756-5111

80 9876543210 00013326 39 9876543210 0000175639

Image Credit: [SoCalGas](http://SoCalGas)



### Parts 1 & 3: Account Number and Amount Due

At the top of this bill is the account number and the address where the service is provided (1), and the date and the amount due for the **Current Billing Cycle** (3).

### Part 2: Account Summary

Next you will find the **Account Summary** (2), which shows the amount of the last bill, information about the last payment received and the new charges for the current billing cycle.

### Part 4: Gas Usage History

On the top right, you will find the **Gas Usage History** (4), which shows the gas usage history for the past 13 months. It is shown as a bar graph, and the table compares your current usage to last month and last year's usage during the same month. This information can be very useful when trying to determine what changes you can make to become more gas efficient.

### Part 5: Current Charges

In the middle of the left column, you will find the **Current Charges** (5), which shows information about how the gas company provides its services, the dates of the billing period, the calculation of the total therms and the calculation of gas charges and taxes. The delivery of the gas (transportation) is included in the overall cost.

**Therms** are the standard unit of gas that gas companies use when determining a bill. One therm equals 100,000 BTUs. The total therms on the bill are calculated by multiplying the amount of gas used this billing period by the Billing Factor multiplied by the BTU Factor, or:

$$(Current\ Reading - Previous\ Reading) \times (Billing\ Factor) \times (BTU\ Factor) = Therms$$

**BTU** is short for British thermal unit. BTUs are used to measure the heat content of natural gas. It is defined as the amount of heat required to increase the temperature of one pound of water one degree Fahrenheit at the temperature at which water has its greatest density (~39°). One BTU is approximately the same amount of energy released by burning a match. The **BTU Factor** is used to express the heating content of the gas. The **Billing Factor** is used to account for the changes in delivery pressure, altitude and meter calibration. These adjustments are made to ensure the value of the natural gas is the same for all customers, no matter their location.

### Part 8: Paperless Billing

At the bottom of the bill, you will find the payment stub to send in with the payment with a reminder about **Paperless Billing** (8). To save paper and postage, the account can be signed up for paperless billing on the online account.

It is important to know that consumer demand affects the average price of natural gas throughout the United States. Other factors that can affect the price include distribution costs, state regulations and competing suppliers.

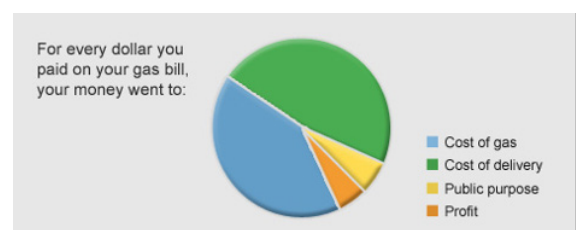


Image Credit: [SoCalGas](#)

The following slide shows the service territory of SoCalGas and includes some facts about the company.

## WHO WE ARE...

**SoCalGas & SDG&E Service Territory**



- **Largest natural gas distribution** utility in the US
- An active part of the community for more than **140 years**
- Serve **12 counties** (over 500 communities) and more than **21 million** people
- Over **5.8 million** gas meters
- More than **8,000 employed**

**SoCalGas** a Sempra Energy utility

Image Credit: [SoCalGas](https://www.socalgas.com)

## Cooking with Natural Gas

Knowing the amount of time it takes for your equipment to heat up is essential to energy-effective cooking. Before modern gas cooking appliances were available, chefs would turn ranges on in the morning and leave them on all day so they were hot and ready to use when an order came in. Today, this is a costly practice due to high energy costs.

A benefit of modern natural gas cooking appliances is the relatively short preheat time. Because of this, burners can be turned on when you are ready to cook and turned off immediately after. Simply turning off gas or powering down to idle mode kitchen appliances that are not in use can help reduce wasted gas, higher gas bills and unnecessary heat in the kitchen.

## 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: Sautéing

Dry cooking methods include broiling, grilling, griddling, roasting, baking, sautéing and deep frying. Each method utilizes the circulation of hot air or contact with fat to transfer heat in order to cook the food. This lesson will utilize a natural gas wok range and the sautéing cooking method.

Sauté is a French word that means “jumped.” Sautéing is generally performed in a shallow sauté pan over a burner on a natural gas range. This dry cooking method relies on a small amount of fat at a medium-high temperature to transfer heat to the food. Stir-frying is very similar to the standard sauté technique. In sautéing, the food is tossed by flipping a sauté pan to quickly cook small pieces of food over high heat, stirring constantly.



In stir-frying, small pieces of food are quickly cooked over high heat, stirring constantly with a shovel (wok spatula). A special pan called a wok is used. A wok is a round-bottomed pan and sits over a special burner or a special wok range like the one in the photograph.

Carbon steel woks are preferred because they quickly and evenly heat up. Anodized aluminum or Teflon non-stick woks should not be used over high heat as the coating will start to break down at higher temperatures.

As the protein cooks, liquid seasoning like soy sauce can be added. This should be added in small quantities or else the temperature in the pan will drop too low and the protein will simmer in the liquid. When the protein is almost done, quick-cooking vegetables (leafy greens and bean sprouts) can be added to the wok. If vegetables like onions, carrots and broccoli are to be cooked, the protein should be removed from the wok when it is almost done cooking. Vegetables can then be added to the pan, adding onions first, followed by carrots and broccoli, and quick-cooking vegetables last. When the vegetables are almost ready, liquid ingredients (water or stock) should be added and the vegetables cooked through. The protein is then added back to the wok and reheated with the vegetables. If you prefer to thicken the stir-fry liquid, a slurry of cornstarch and water can be added to the wok. Toss the slurry with the ingredients and cook until the liquid is the desired thickness.





True stir-frying requires a wok, but the same technique can be used with a standard sauté pan. It is important to cut vegetables and protein into evenly sized pieces. This helps ensure they are cooked evenly. Any protein should be cooked first in small batches, taking care not to overcrowd the pan. Vegetables are then cooked, starting with vegetables that take longer to cook like broccoli, carrots and cauliflower, followed by quick-cooking vegetables like leafy greens and bean sprouts. At the very end, stock and pre-cooked noodles can be added.

Foods like small cuts of meat, scallops, zucchini, cauliflower, onions and peaches cook well when sautéed. You will learn how to sauté, as well as use other forms of dry heat, to cook various proteins, vegetables and starches throughout your lessons on dry cooking.



## Instructor Demonstration

Watch the instructor demonstration on proper natural gas range safety and how to stir-fry broccoli and protein. Answer the following questions as you watch the demonstration.

- What safety tips did the instructor give during the demonstration?
- How is stir-frying different from sautéing? How is it similar?
- In what order did the instructor add the broccoli and proteins to the wok?
- How did the instructor safely toss the vegetables?
- How did the instructor determine how long to cook the broccoli and proteins?

## 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 stir-fry using broccoli and protein. Once cooked, the broccoli and protein can be served with noodles or on a bed of rice. You can optionally add other vegetables and seasonings to the stir-fry.

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 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 oil, protein, liquid seasoning and grain categories. You will also need broccoli and optional oil seasonings, optional vegetables and optional liquids. You can choose to add any additional toppings or flavors based on your dietary preferences, restrictions or 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 an oil:	Select a protein:	Select optional oil seasonings:	Select a liquid seasoning:	Select optional vegetables:	Select an optional liquid:	Select a grain:
canola	chicken	salt	soy sauce	broccoli	vegetable stock	cooked
peanut	steak	garlic	sesame oil	cauliflower	chicken stock	noodles
avocado	pork	ginger root		carrots	water	rice
	shrimp	scallions			curry sauce	
	tofu					

### Safety first:

- Always keep a Class ABC fire extinguisher nearby.
- Turn the gas range off once you are done stir-frying.
- Use an oil with a high smoke point like canola, peanut, grapeseed or avocado oil. Oils with low smoke points like olive oil and sesame oil will break down at high temperatures.
- Never use wet or moist potholders, oven mitts or towels, as this will conduct heat, burning your hands.
- Practice knife safety when cutting the vegetables and use knives that are properly sharpened.

### Equipment:

- French knife (chef's knife) or paring knife
- Boning knife for protein
- Cutting board
- Gas wok range
- Wok
- Shovel

### **Ingredients:**

- Choice of oil
- Choice of protein
- Choice of optional oil seasonings
- Choice of liquid seasoning
- Broccoli
- Choice of optional vegetables
- Choice of optional liquid
- Choice of grain

### **Procedure:**

1. Rinse broccoli and optional vegetables.
2. Cut vegetables and protein into small, evenly sized pieces.
3. Place the wok over high heat.
4. Add a small amount of oil and optional seasonings.
5. Heat the oil until it shimmers.
6. Add protein to the wok in small batches, being careful not to overcrowd.
7. Sear protein for about a minute before stirring.
8. Add optional liquid seasoning to the protein.
9. Remove protein from the wok before it is fully cooked.
10. Add broccoli and optional vegetables to the pan.
11. Add optional liquid ingredients when vegetables are almost cooked.
12. Return protein to the wok and reheat.
13. Add optional cooked noodles to the wok.
14. Add optional cornstarch and water slurry to the wok until the sauce is the desired thickness.
15. Turn off the wok range.
16. Serve broccoli, optional vegetables and protein with your choice of grain.



### Tips:

- Cut vegetables and protein into evenly sized pieces.
- Avoid the following to keep the temperature of the fat in the pan high enough to sauté (and not simmer):
  - » overcrowding the pan
  - » adding wet vegetables
  - » adding too much liquid seasoning
- Do not overcook the protein. It will continue to cook when it is returned to the wok.
- The key to sautéing is using high heat and a small amount of oil to cook food quickly. Be careful to not use too much oil.
- Leave protein alone for about a minute to sear and seal in the protein's juices.
- Do not cook all vegetables at the same time. Add tough vegetables first and soft vegetables last.
  - » tough vegetables: carrots, broccoli, cauliflower, onions
  - » medium vegetables: green beans, snap peas, mushrooms, bell peppers, zucchini
  - » soft vegetables: spinach, bok choy, cabbage, bean sprouts, tomatoes

## Activity

After you finish cooking your stir-fry, create flashcards with vegetables on one side and their classification (soft, medium, tough) on the opposite side. Use the flashcards to study the types of vegetables to gain a better understanding of which order to add vegetables in a stir-fry recipe.

bean sprouts  
carrots  
snap peas

bell peppers  
cauliflower  
spinach

bok choy  
green beans  
tomatoes

broccoli  
mushrooms  
zucchini

cabbage  
onions

## Final Assessment

1. What does the French word “sauté” mean in English?
  - a. stirred
  - b. jumped
  - c. tossed
  - d. fried
2. What temperature should the range be set to while stir-frying?
  - a. medium-low
  - b. medium
  - c. medium-high
  - d. high
3. Which is the correct cooking order of vegetables when stir-frying?
  - a. bok choy ⇒ mushrooms ⇒ broccoli
  - b. broccoli ⇒ mushrooms ⇒ bok choy
  - c. mushrooms ⇒ bok choy ⇒ broccoli
  - d. mushrooms ⇒ broccoli ⇒ bok choy
4. What is the type of steel used to make restaurant grade woks?
  - a. alloy steel
  - b. aluminum steel
  - c. carbon steel
  - d. stainless steel
5. What is the term given to preparing a sauté pan or wok for high heat cooking?
  - a. coating
  - b. oiling
  - c. rubbing
  - d. seasoning

# **Intermediate Cooking with Gas—Beginner**

## **Lesson 6: Sautéing**

### **Teacher Guide**

(1-2 class sessions depending on setting)

## **Introduction**

This lesson covers a basic understanding of sautéing. Then, students will learn how natural gas is used on a wok range to stir-fry broccoli and proteins. 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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  - c. rubbing
  - d. seasoning



## Understanding Your Gas Bill (5 minutes)

Students will read about how to read a gas bill to find ways to save energy and gas. The following questions could be used for a class discussion or given to students to complete individually.

- What are therms and BTUs?
- How is your gas bill calculated?
- How do you read the Gas Usage History bar graph and table?

## Cooking with Natural Gas (5 minutes)

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

- What is an advantage of natural gas ranges?
- How much preparation should be done before cooking?
- How can you monitor your gas bill to see if you are reducing wasted gas?

## Cooking Methods (1 minute)

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

## Dry Cooking: Sautéing (5 minutes)

Students will read about cooking with dry heat and the sautéing 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?
- How is stir-frying different from sautéing? How is it similar?
- In what order should the proteins and vegetables be added to the wok?

## Instructor Demonstration (10 minutes)

The demonstration can either be performed in class or recorded for remote use. If the demonstration is done in person, prepare the vegetables, proteins, seasonings and other optional ingredients while the students complete their readings so that the broccoli and proteins are ready in time for your demonstration.

You may also consider prepping the broccoli, proteins and extra ingredients for student use before class or while students complete their readings. This way, the students may begin cooking directly following the demonstration rather than spending time cutting the food and finding seasonings and optional ingredients after the demonstration.

The demonstration should include:

- how a natural gas range works
- safety tips when using a natural gas range
- how to stir-fry, including tips on how high to have the flames and how much oil to use
- benefits of using stir-frying as a cooking technique
- how to cook broccoli and proteins, noting how to check the proteins and broccoli for doneness
- benefit of not overcrowding the pan or using too much liquid seasoning
- finishing the stir-fry with noodles or rice and incorporating other optional ingredients
- knife techniques and safety when cutting ingredients

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 much oil did the instructor put into the wok?
- How high did the instructor have the flame?
- How did the instructor determine how long to cook the broccoli and the proteins?
- What cooking tips did the instructor give during the demonstration?

## Selecting and Preparing a Recipe (20 minutes)

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.

If the students will be cooking at home, be sure to provide the list of ingredients or the “mise en place” ahead of time to give the students time to assemble the ingredients. Take into consideration 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 stir-fry. Students will select an oil, a protein, broccoli, a grain and optional seasonings and vegetables 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.

Scoring Rubric:

Criteria	Excellent 3	Proficient 2	Emerging 1
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## Activity (5 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 create flashcards with vegetables on one side and their classification (soft, medium, tough) on the opposite side. They will then use the flashcards to study vegetables and gain a better understanding of which order to stir-fry vegetables.

bean sprouts

(soft)

carrots

(tough)

snap peas

(medium)

bell peppers

(medium)

cauliflower

(tough)

spinach

(soft)

bok choy

(soft)

green beans

(medium)

tomatoes

(soft)

broccoli

(tough)

mushrooms

(medium)

zucchini

(medium)

cabbage

(soft)

onions

(tough)



## 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. What does the French word "sauté" mean in English?
  - a. stirred
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  - c. tossed
  - d. fried
2. What temperature should the range be set to while stir-frying?
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Beyond the  
**Blue  
flame**