



# Introduction to Cooking with Gas

Lesson 3: Deep Frying

**ADVANCED**



## Introduction

Welcome to Introduction to Cooking with Gas. Today's topic is understanding fats and oils and how to deep fry safely. Once you learn about fats and oils, you will learn how to cook with gas to make your own delicious deep-fried dish.

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. How can you tell the difference between a fat and or an oil?
  - a. whether it is used or not used for cooking food
  - b. whether it is flammable or not flammable
  - c. whether it is flavored or flavorless
  - d. whether it is a solid or liquid at room temperature
2. What is one way your body uses fats and oils?
  - a. to build muscle
  - b. to break down toxins
  - c. to absorb vitamins
  - d. to move oxygen in the blood
3. What occurs when a fat or oil is heated to its smoke point?
  - a. It breaks down.
  - b. It melts.
  - c. It boils.
  - d. It condenses.
4. Why is deep frying dangerous?
  - a. The fat or oil can cause an electrical fire.
  - b. The fat or oil can aid the growth of bacteria.
  - c. The fat or oil can reach a very high temperature.
  - d. The fat or oil is poisonous.
5. What type of equipment could you use for deep fat frying?
  - a. a shallow pan and spatula
  - b. a baking sheet and parchment paper
  - c. a mixer and deep mixing bowl
  - d. a deep covered heavy pot and tongs

## What Are Fats and Oils?

Butter, olive oil and corn oil are just a few of the many fats and oils found in people's diets. Many common foods have fat or oil as the main ingredient, such as mayonnaise and salad dressing. Fats and oils are also used in cooking.



Image credit [Bill Branson](#)

Living organisms need fats and oils for healthy functioning. In people, oils and fats provide energy, are used by the body to make essential components, and help the body absorb vitamins such as A, D, E and K.

Butter is a fat that is produced from milk by separation. Oils are produced by pressing and extraction from grains, seeds and nuts.

Fats and oils are **triglycerides**, a chemical structure. The triglyceride structure is composed of a glycerol connected to three **fatty acids**. The composition and length of the fatty acids is different in different fats and oils.

The image shows a triglyceride molecule. The glycerol is on the left and the three chains on the right are the fatty acids.

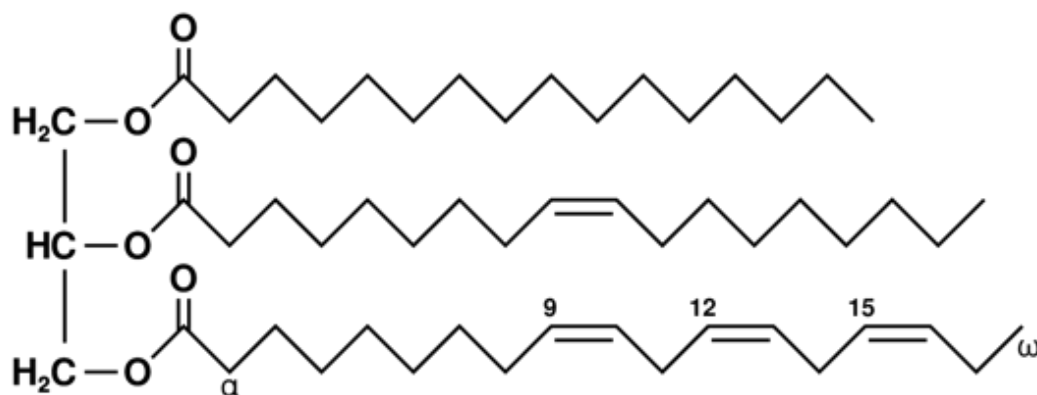


Image credit [Wolfgang Schaefer](#)

The fatty acids determine the melting point of the fat or oil. A **fat** is a solid at **room temperature** (70°F), and an **oil** is a liquid at room temperature. When heated, fats melt and become a liquid.

You cannot mix water with fats or oils because they do not dissolve in each other. In general, some substances **dissolve** in water and some substances dissolve in fats or oils. These differences in solubility are related to the chemical structures of water and of fats and oils.



As shown in the image, fats and oils are made up of large complex molecules. Because of the complexity of the molecules in fats and oils, they remain a liquid even when heated to high temperatures.

Fats and oils do not boil. Instead, at a certain temperature, a fat or oil begins to burn and smoke. The temperature at which this occurs is called the **smoke point**. Different fats and oils have different smoke points.

The smoke point is an important factor to consider when choosing a cooking oil. In deep frying, you want to attain a high temperature without any decomposition of the fat or oil. Use the oil type that is recommended by the manufacturer based on the type of foods to be fried in the fryer.

Deep frying is dangerous due to the high heat of the fat or oil, which can cause severe burns. Fats and oils are also **flammable** (can catch fire when heated).

Never add water to hot fat or oil. Water is more dense than fats and oils and will not mix with them. When water is added to hot fat or oil, it sinks to the bottom and then is vaporized by the heat. The volume of the water vapor is much greater than the volume of the water, so the vapor expands. The expanding vapor causes the hot fat or oil to spray and splatter, which can cause burns and spread fire.

## Cooking with Natural Gas

Natural gas is an inexpensive and efficient source of heat when it is lit on fire. The ability to control the amount of heat on a gas range is important in deep frying because the temperature determines the quality of the food. The ability to quickly turn off the flame on a gas range can help control a fire in fat or oil.

When deep frying, follow these safety precautions in addition to following general kitchen safety precautions:

- Use oil with a high smoke point.
- Use a food thermometer to check the temperature of the fat or oil and ensure that the temperature does not go higher than 375°F.
- Use a heavy pan that is large and wide and has a tight-fitting cover. Do not use the cover when deep frying, but have it on hand in case the oil catches on fire.
- Never fill the pan more than two-thirds full of oil.
- Add food slowly to hot fat or oil because bubbling can occur.
- Never put food that has water on it in the fryer. Leave frozen items in the freezer until ready to fry to avoid thawing and melting of ice crystals.
- Stay near the hot fat or oil, as it can easily catch on fire.
- Remove the fried food with a basket, large slotted spoon or tongs and allow the fat or oil to drain before lifting out.
- Never place hot fats or oils in the garbage.
- If the fat or oil starts to smoke, turn off the heat.
- If the hot fat or oil catches on fire, turn off the flame and use a lid or a Class B fire extinguisher to put out the flame. Do NOT use water because the fat or oil will splatter and spread the fire. If you cannot put out the fire safely, evacuate

immediately and call 911.

If not overheated, fat or oil can be reused up to 10 times. The fat or oil must be cooled and filtered after each use and poured back into its original container. Dispose of the used-up fat or oil at a recycling point if available, as the fat or oil can be converted to biofuels. Never pour fat or oil down the drain.

## 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: Deep Frying

Dry cooking methods include broiling, grilling, griddling, roasting, baking, sautéing and deep frying. Each method utilizes dry, hot air or hot fat in order to cook the food. This lesson will utilize a deep fat fryer and the dry cooking method. Most foods can be deep fried if prepared properly to reduce any excess water. Deep frying with hot fat or oil at high temperature **dehydrates** food (dehydrates means to remove water). Deep frying affects the taste and texture of food due to chemical and physical changes and the absorption of some oil by the food.

You will learn how to utilize deep frying, as well as other forms of dry heat, to cook various proteins, vegetables, starches, and even sweet items like desserts, throughout your lessons on dry cooking. Using natural gas enables the cook to quickly control the amount of heat transferred to the pan or to increase or decrease the flames. The hot fat or oil can be kept at the correct temperature needed to produce quality food.

## Instructor Demonstration

Watch the instructor demonstration on deep frying safety and on how to make fried chicken. Answer the following questions as you watch the demonstration.

- What are the steps for preparing fried chicken?
- What safety tips did the instructor give during the demonstration?
- How much oil did the instructor put into the pot?
- How high did the instructor have the flame underneath the pot?
- How did the instructor determine when the chicken pieces were done?
- 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 dish of fried chicken. Since deep frying is dangerous, you will write a recipe to mix the batter and determine which seasonings to use.

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.

<b>Criteria</b>	<b>Excellent 3</b>	<b>Proficient 2</b>	<b>Emerging 1</b>
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

While you will not be making fried chicken, you will choose which seasonings you would add to the basic batter and write a recipe. Choose additional flavors based on your dietary preferences, restrictions or allergies.

### Seasoning suggestions for batter (or select your own):

basil	garlic powder	paprika
cayenne	garlic salt	parsley (dried)
chili powder	ginger	pepper
celery salt	mustard powder	salt
cumin	onion salt	turmeric
curry	oregano	thyme

### Safety first:

- Always keep a Class ABC fire extinguisher nearby.

### Basic batter recipe ingredients::

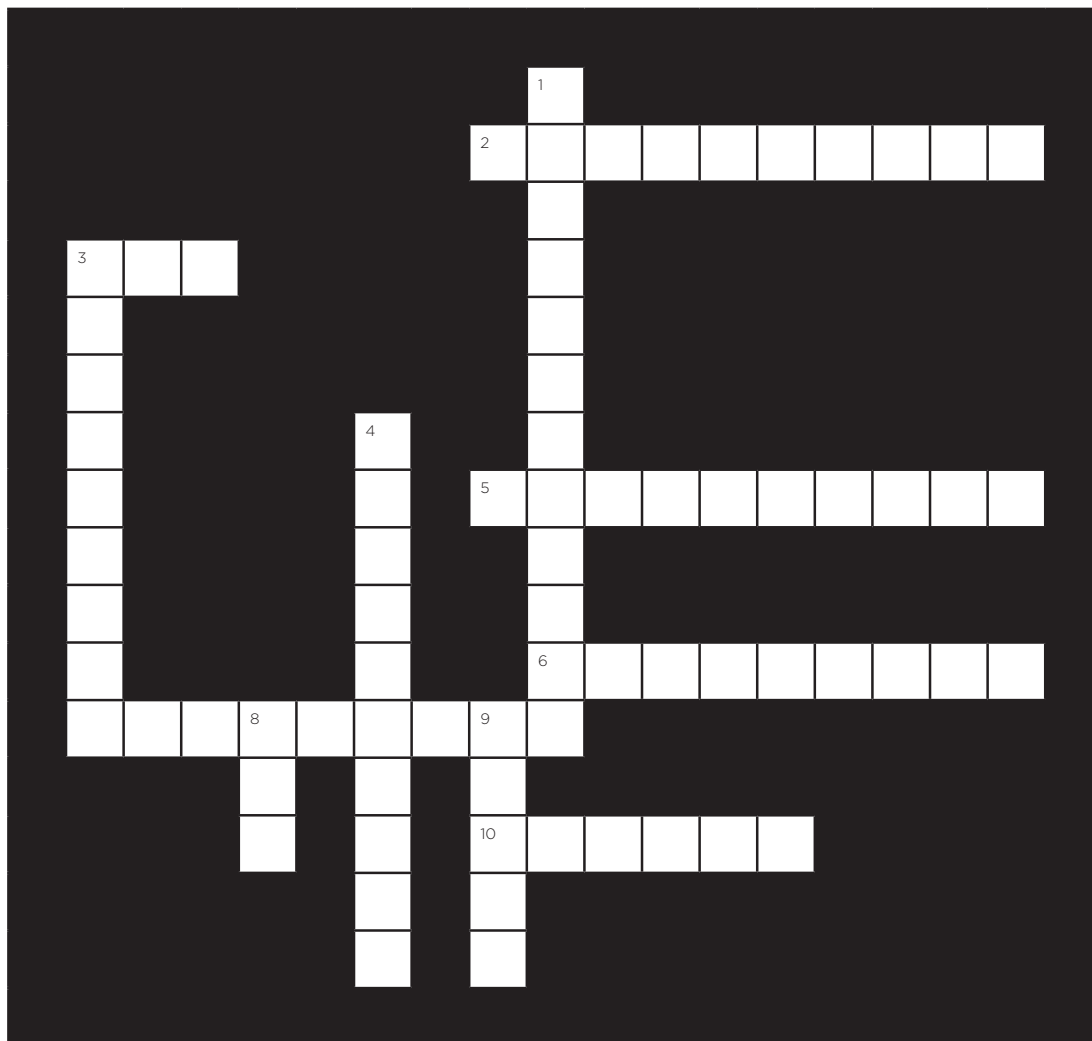
- 3 cups milk or dairy-free substitute such as unsweetened almond milk, cashew or coconut milk
- 3 tablespoons white vinegar
- 2 cups wheat or rice (gluten-free) flour
- 1 cup corn starch
- optional seasonings

### Procedure:

1. Choose a selection of seasonings to use in the fried chicken batter.
2. Write a recipe for making the batter and dredging the chicken pieces based upon the demonstration.

## Activity 1

Fill out the crossword puzzle using the numbered clues. The answers are bolded words from the reading.



### Across

- Name for methods of cooking that utilize dry, hot air or hot fat (2 words)
- Butter is an example
- Method of cooking in which food is placed in hot fat or oil (2 words)
- Remove water
- Break down
- Phase of an oil at room temperature

### Down

- Chemical structure found in fats and oils (1 word)
- Another chemical structure found in fats and oils (2 words)
- Temperature at which a fat or oil decomposes (2 words)
- Olive oil is an example
- Phase of a fat at room temperature

## Activity 2

Use the internet to research unsaturated, saturated and trans fats. Write a brief description of the three kinds of fats and note which fats are recommended in the diet. List two sources.

## Final Assessment

1. How can you tell the difference between a fat and or an oil?
  - a. whether it is used or not used for cooking food
  - b. whether it is flammable or not flammable
  - c. whether it is flavored or flavorless
  - d. whether it is a solid or liquid at room temperature
2. What is one way your body uses fats and oils?
  - a. to build muscle
  - b. to break down toxins
  - c. to absorb vitamins
  - d. to move oxygen in the blood
3. What occurs when a fat or oil is heated to its smoke point?
  - a. It breaks down.
  - b. It melts.
  - c. It boils.
  - d. It condenses.
4. Why is deep frying dangerous?
  - a. The fat or oil can cause an electrical fire.
  - b. The fat or oil can aid the growth of bacteria.
  - c. The fat or oil can reach a very high temperature.
  - d. The fat or oil is poisonous.
5. What type of equipment could you use for deep fat frying?
  - a. a shallow pan and spatula
  - b. a baking sheet and parchment paper
  - c. a mixer and deep mixing bowl
  - d. a deep covered heavy pot and tongs

# Intermediate Cooking with Gas—Advanced

## Lesson 3: Deep Frying

### Teacher Guide

(1-2 class sessions depending on setting)

## Introduction

This lesson covers a basic understanding of the structure and properties of fats and oils. Then, students will learn how natural gas is used on a range to heat a fat or oil. Because deep frying is dangerous, this lesson will only demonstrate the technique. Keep in mind that students may have dietary preferences, restrictions or allergies that you may want to address in discussing deep fried foods.

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.

1. How can you tell the difference between a fat and or an oil?
  - a. whether it is used or not used for cooking food
  - b. whether it is flammable or not flammable
  - c. whether it is flavored or flavorless
  - d. whether it is a solid or liquid at room temperature
2. What is one way your body uses fats and oils?
  - a. to build muscle
  - b. to break down toxins
  - c. to absorb vitamins
  - d. to move oxygen in the blood
3. What occurs when a fat or oil is heated to its smoke point?
  - a. It breaks down.
  - b. It melts.
  - c. It boils.
  - d. It condenses.
4. Why is deep frying dangerous?
  - a. The fat or oil can cause an electrical fire.
  - b. The fat or oil can aid the growth of bacteria.
  - c. The fat or oil can reach a very high temperature.
  - d. The fat or oil is poisonous.
5. What type of equipment could you use for deep fat frying?
  - a. a shallow pan and spatula
  - b. a baking sheet and parchment paper
  - c. a mixer and deep mixing bowl
  - d. a deep covered heavy pot and tongs

## What Are Fats and Oils? (10 minutes)

Students will read about the importance of fats and oils for living organisms and the structure and properties of fats and oils. The following questions could be used for a class discussion or given to students to complete individually.

- Why is it important to have fats and oils in a diet?
- What is the difference between fats and oils?
- What is the smoke point?
- What chemical structure is found in fats and oils?
- What are three kinds of oils that are often used in deep frying?

## Cooking with Natural Gas (3 minutes)

Students will read about using gas to deep fry. The following questions could be used for a class discussion or given to students to complete individually.

- Why is deep frying dangerous?
- Why is temperature control important in deep frying?

## 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: Deep Frying (2 minutes)

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

- How is cooking a food with oil different from cooking a food with water?
- How does using a natural gas burner help control the amount of heat transferred to the oil?

## Instructor Demonstration (10 minutes)

Use your favorite recipe for making fried chicken. The demonstration can either be performed in class or recorded for remote use. If the demonstration is done in person, prepare the chicken pieces ahead of time and start heating the oil for your demonstration while the students complete their readings. Also have cooked pieces available to demonstrate so that the complete cooking process does not have to be demonstrated. Review the steps and ask students to write them down so that they can complete Activity 1.

The demonstration should include:

- a summary of the steps for preparing fried chicken
- how a gas range works
- safety tips when using a gas range
- how to prepare the chicken pieces
- how to use a deep fryer
- safety tips when using a deep fryer
- how to determine if the chicken pieces are done
- how to absorb excess oil from the chicken pieces

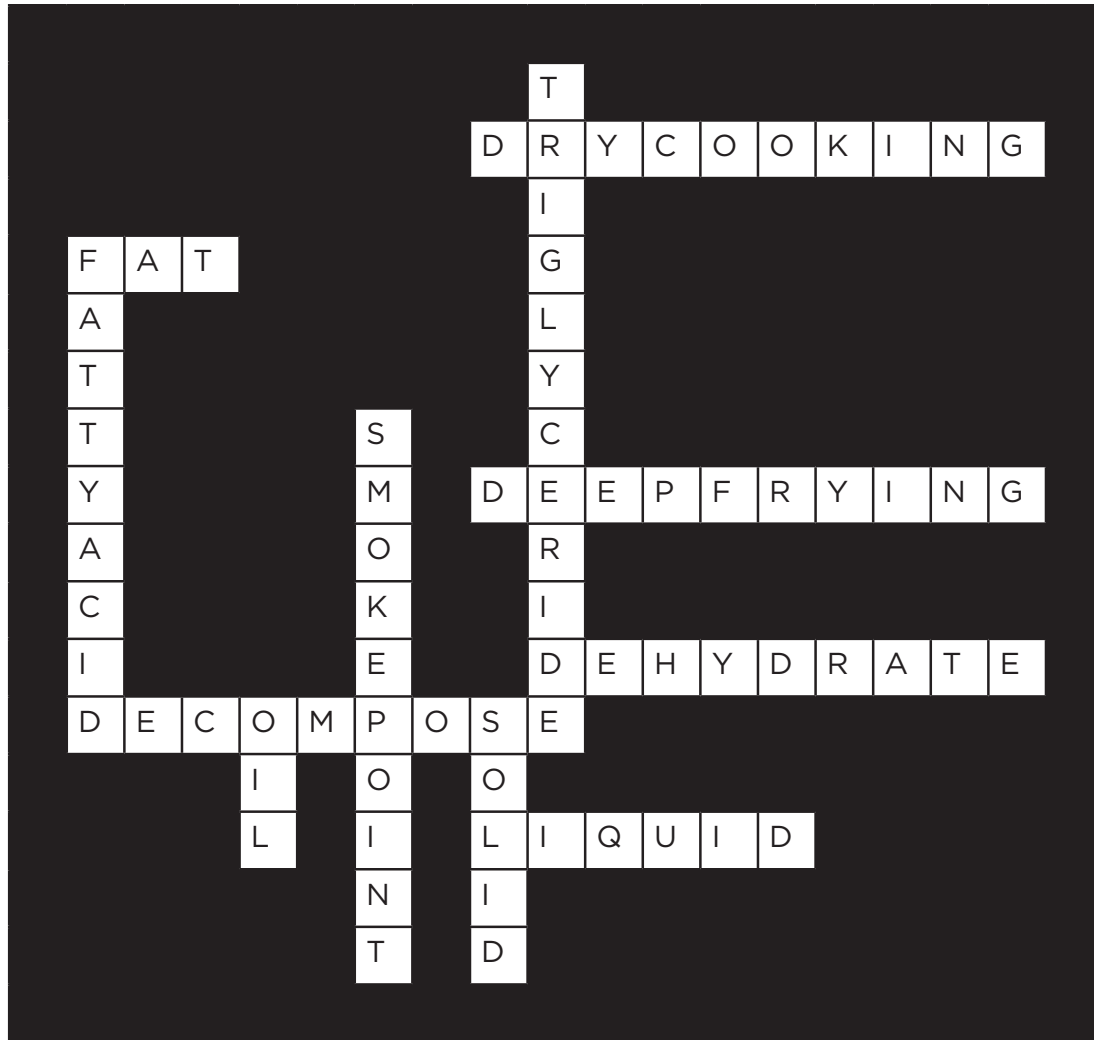
Students will use the following questions as a guide to either a class discussion after or note taking during the demonstration:

- What are the steps for preparing fried chicken?
- What safety tips did the instructor give during the demonstration?
- How much oil did the instructor put into the pot?
- How high did the instructor have the flame underneath the pot?
- How did the instructor determine when the french fries were done?
- What cooking tips did the instructor give during the demonstration?

## Activity 1 (4 minutes)

Students complete a crossword puzzle.

Key:





## Activity 2 (10 minutes or as homework)

Students are given this assignment:

Use the internet to research unsaturated, saturated and trans fats. Write a brief description of the three kinds of fats and note which fats are recommended in the diet. List two sources.

Scoring Rubric:

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

## 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. How can you tell the difference between a fat and or an oil?
  - a. whether it is used or not used for cooking food
  - b. whether it is flammable or not flammable
  - c. whether it is flavored or flavorless
  - d. whether it is a solid or liquid at room temperature
2. What is one way your body uses fats and oils?
  - a. to build muscle
  - b. to break down toxins
  - c. to absorb vitamins
  - d. to move oxygen in the blood
3. What occurs when a fat or oil is heated to its smoke point?
  - a. It breaks down.
  - b. It melts.
  - c. It boils.
  - d. It condenses.
4. Why is deep frying dangerous?
  - a. The fat or oil can cause an electrical fire.
  - b. The fat or oil can aid the growth of bacteria.
  - c. The fat or oil can reach a very high temperature.
  - d. The fat or oil is poisonous.
5. What type of equipment could you use for deep fat frying?
  - a. a shallow pan and spatula
  - b. a baking sheet and parchment paper
  - c. a mixer and deep mixing bowl
  - d. a deep covered heavy pot and tongs

Everything  
Connects with

**NTC**<sup>®</sup>



[www.nationaltheatre.com](http://www.nationaltheatre.com)

Beyond the  
**Blue  
flame**