



Fire Science/Safety: Extinguishing Fires

Illinois CTE Endorsement Area:
Agriculture, Food & Natural Resources
Teacher and Student Editions

Original Lesson Developers: Dawn Palmer Rosenbaum, Britney Holtman, and Amand Perez Rosser
ILCTE Leader, Linda Walker
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Converted to Format by Karen Aldworth
Current Phase of Lesson: Phase 3 of 5



**Illinois
State Board of
Education**



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Lesson Overview:

Fire safety is taught at the beginning of every Foods/Culinary Arts course. This lesson will provide simple experiments that will reinforce this principle. Students will extinguish candle flames using different materials. They will develop a diagram and prepare a public service announcement containing the information they have learned.

Classes or Discipline:

- All Culinary/Foods Classes
- Intro to FCS
- Independent Living/Adult Living
- Agriculture Resource Management

Career Cluster:

- [Agriculture, Food & Natural Resources](#)

Illinois CTE Endorsement Area:

- [Agriculture, Food & Natural Resources](#)

Grade Level(s):

- In a comprehensive FCS program, this topic is appropriate for grades 9-12. It would also be appropriate for a middle school or Jr. High program.

Suggested Days/Minutes: One 60-minute class period.

Learning Objectives:

At the conclusion of this lesson and activities, students will be able to:

- Extinguish a fire effectively when working with a fire in the kitchen.
- Identify the elements of a fire triangle
- Maintain a safe kitchen environment
- Prevent a fire in the kitchen

Standards Addressed:

- [National Standards for Family and Consumer Sciences Education](#)
 - 9.2 Apply risk management procedures to food safety, food testing, and sanitation
 - 5.5 Demonstrate a work environment that provides safety and security.
 - AGPA01.04 Identify and apply food processing, handling, and storage factors to demonstrate their impact on product quality and safety.
- [Next Generation Science Standards](#)
 - ESS3b Natural hazards: A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts.
 - PS1.A: Structure and Properties of Matter

Enduring Understandings:

Fire safety and prevention is a life-long skill that they will be able to demonstrate in the event of an emergency.

Resources and References:

1. Access to the internet.
2. Teacher access to internet for videos.
3. Supplies for experiment:
 - 1 plate
 - 4 tea light candles
 - A lighter or matches
 - 1 glass
 - 1 small jar
 - 1 prep bowl with 2 Tbsp salt
 - 1 prep bowl with 2 Tbsp baking soda
 - Safety glasses
 - Stop watch or phone
4. Handout: [Chart for fire experiment](#)
5. YouTube videos:
 - [Surprise! Exploding Birthday Cake!](#) (1:33)
 - [Kitchen Fire 411](#) (5:19)
 - [Inside Edition: How to safely put out a fire.](#) (1:56)
6. Apps:
 - TikTok

Essential Employability Skills:

There are four [essential employability skills](#)

- Personal Ethic: integrity, respect, perseverance, positive attitude
- Work Ethic: dependability, professionalism
- Teamwork: critical thinking, effective and cooperative work
- Communication: active listening, clear communication

The focus of this lesson is on critical thinking, effective and cooperative work, active listening, clear communication.

Skill	How it is addressed:
Critical Thinking	Students must hypothesize which is the best method to put out a fire and reflect on the various questions that impact formative assessments
Effective and Cooperative Work	Students work together to extinguish fires and analyze what method works best.
Active Listening	Students must comprehend what their peers are saying to complete the chart.
Clear Communication	Students must communicate with each other to complete the chart.

Suggested Differentiation Strategies:

- The questions on the information from the videos can be reduced.
- Evaluation activities can be modified to meet student abilities.
- Using critical thinking prompts, the lesson may be modified for learners of different abilities.

Throughout this lesson, suggested teacher notes and comments are in red.

Pre-Assessment:

Use Kahoot!, quizzes, or paper and pencil to ask the following questions:

1. What are the three components of the fire triangle?
2. What are three highly flammable substances in the kitchen?
3. What will happen if water is used to put out a grease fire?

1. Engage: (10 minutes)

1. Watch the following video. [Surprise! Exploding Birthday Cake!](#) (1:33)
This video shows the result of candles igniting powdered sugar on a birthday cake when the candles are blown out.
2. After you watch the video, reflect on these questions:
 - a. What is burning in the video?
 - b. What caused the fire to flare up?
 - c. Fortunately, this fire seemed to go out very quickly. What could have happened?
 - d. According to the Consumer Product Safety Commission (CPSC), there are 471 home cooking fires per day in the United States. What do you think are some of the main causes?

2. Explore: (20 minutes)

1. Assemble into groups of 4 for this activity. Each of you will rotate the following roles: Ignitor, Timer, Extinguisher, and Watch-person. Everyone should wear safety glasses.
2. Place a tea light candle on a ceramic (not plastic, paper, or foam) plate.
3. Do the following:
 - a. Ignitor: Light the candle.
 - b. Timer: Start the stopwatch.
 - c. Extinguisher: Place the large glass over the candle.
 - d. Watchperson: Watch the flame, and notify the timer when there is no longer a flame present, and when to stop the timer.
4. Record in your journal or on a piece of paper answers to the following questions:
 - a. What happened to the flame?
 - b. Why?
 - c. How long did it take to go out?
5. Rotate jobs
6. This time place a small jar over the candle.
7. Do the same procedure as before and answer the same questions.

8. Rotate jobs again.
9. This time drop a pinch of salt over the candle.
10. Do the same procedure as before and answer the same questions.
11. Rotate jobs one more time.
12. In this rotation drop a pinch of baking soda over the candle.
13. Do the same procedure as before and answer the same questions.
14. Complete the Chart Below:

Method	Time	What was Removed
Glass		
Prep bowl of baking soda		
Prep bowl with salt		
A small jar		

3. Explain: (10 minutes)

1. Which method for extinguishing the fire worked the quickest? Why do you think this is?
Answers will vary but should be based on the observations in the experiments.
2. List three safety rules when working with fire?
Answers will vary but should be based on the observations in the experiments.
3. What common method of putting out a fire did we not practice?
Using water
4. Why should you not use water on a kitchen fire?
Flames will increase if it is a grease fire.
5. List the things that need to be removed to stop a fire.
Heat, fuel, and air should be evident from the experiments and the chart
6. So, what does a fire need in order to burn?
This question helps make the transition to identifying the fire triangle in the next question.
7. What is the “Fire Triangle?”
Fuel, Air, and Heat. Remove any of these three and the fire will stop. The reason water increases a grease fire is because the amount that is usually thrown on the fire is too small to decrease the heat or remove the air. In fact, it usually splashes the grease out of the pan, spreading the fuel and giving it more air.

Elaborate/Extend: (20 minutes)

1. Watch the following videos and discuss the following questions in a small group.

[Kitchen Fire 411](#) (5:19)

[Inside Edition: How to safely put out a fire.](#) (1:56)

- a. What are some fire hazards in the kitchen?
Towels, pot holders, curtains
 - b. What happens if you do not properly extinguish a fire?
It will flame up again.
 - c. How could you make sure that your environment is prepared in case of a fire?
Have a fire extinguisher, baking soda, and salt near the stove.
 - d. Picture you are at a birthday party and Totino's pizza rolls are on fire. What would you do in this situation if a fire broke out?
Try to smother flames.
 - e. When should you call 911?
When the flames cannot be put out.
 - f. How do you determine the fire is out?
There are no flames or smoke.
 - g. If you completely put out the fire, do you need to call 911?
No, not if you are absolutely certain the flames are out and nothing else has caught fire.
2. Make a fire safety checklist to be placed inside the kitchen cabinet.
 3. Use your checklist to review your FCS kitchen, the school cafeteria kitchen and/or your kitchen at home. Write your recommendations.

Evaluate:

1. Draw a diagram (or several sketches) of how to use a fire extinguisher using the PASS method (Pull, Aim, Squeeze, Sweep)

Category	3	2	1
Content	All four components of the PASS method were illustrated in the drawing	Only three of the four components of the PASS method were used in the drawing. The drawing has some correct and some incorrect information.	Information is largely inaccurate, absent, or irrelevant.
Diagram	The information is presented in a clear and attractive manner	The information is correct, but the diagram is a bit confusing	It is not clear what is being communicated with the sketches

2. Create a PSA (Public Safety Announcement) sketch about fire safety for a third grader.

Category	3	2	1
Vocabulary	The public service announcement is presented using vocabulary that a third-grade student would understand.	Parts of the announcement use vocabulary that would be unfamiliar to a third grader	Content of the announcement is inappropriate for a third grader.
Information	All information in the public service announcement is accurate.	Parts of the public service announcement are incorrect	Very little of the information in the public service announcement is accurate.

3. Create a TikTok about fire safety

Category	3	2	1
Information	All information about Fire Safety in the TikTok is correct	Parts of the information about Fire Safety in the TikTok is correct	Information is largely inaccurate, absent, or irrelevant.
Presentation of materials	Material presented is grammatically correct and information is clearly stated.	Some grammatical mistakes or unclear directions.	Information is mostly inaccurate and unclear.

Download the TikTok app from the App store.

Notes:

All ILCTE lessons are vetted by: Curriculum Leader, Dr. Brad Christensen.

To see a review of this lesson by previous users, please [click here](#).

We invite users of this lesson to [click here](#) to leave follow up information and rating.

We would like to publish pictures/videos of your students using this lesson. Please send to Rod McQuality at: rdmcqua@ilstu.edu. By sending pictures, you have met all picture/video release for your school.

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Fire Science/Safety- Extinguishing Fires

Student Edition

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2. Explore:

1. Assemble into groups of 4 for this activity. Each of you will rotate the following roles: Ignitor, Timer, Extinguisher, and Watch-person. Everyone should wear safety glasses.
2. Place a tea light candle on a ceramic (not plastic, paper, or foam) plate.
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6. This time place a small jar over the candle.
7. Do the same procedure as before and answer the same questions.
8. Rotate jobs again.
9. This time drop a pinch of salt over the candle.
10. Do the same procedure as before and answer the same questions.
11. Rotate jobs one more time.
12. In this rotation drop a pinch of baking soda over the candle.
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3. Explain:

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2. List three safety rules when working with fire?
3. What common method of putting out a fire did we not practice?
4. Why should you not use water on a kitchen fire?
5. List the things that need to be removed to stop a fire.
6. So, what does a fire need in order to burn?
7. What is the "Fire Triangle?"

Elaborate/Extend:

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Evaluate:

Your teacher may use the following rubrics to evaluate your understanding of the information from lesson.

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