

Safety Smart® Science with Bill Nye the Science Guy: FIRE

Synopsis

Students in grades four through eight join Bill Nye the Science Guy as he delves into the science behind fire. The activities in this Educator's Guide reinforce and expand on science concepts introduced in the program and provide opportunities for students to apply research, writing, analytical, and teamwork skills.

Objectives

The content of the DVD addresses the following objectives:

Students will understand that:

- Fire can be destructive as well as helpful.
- Fire needs fuel, heat, and oxygen to keep it burning; remove any one of these, and the fire goes out.
- Fire is a chemical chain reaction that occurs when fuel heats up, releasing flammable gases that react with oxygen in the air; all fuel must become a gas before it burns.
- Heat is transferred by conduction, convection, and radiation.
- Fire safety engineers at Underwriters Laboratories use controlled burns to make sure household items meet safety standards.
- Flashover is when all flammable materials in a room burst into flame due to radiation.
- Because heat and smoke rise, anyone in a fire should get down and get out, then call for help.
- Smoke is deadly because it contains toxic gases.
- Knowing the science of fire enables you to control fire.
- Chances of surviving a fire increase by having working smoke and carbon monoxide alarms, home sprinklers, a fire extinguisher, and a fire escape plan.

Activities in this Educator's Guide address the following objectives:

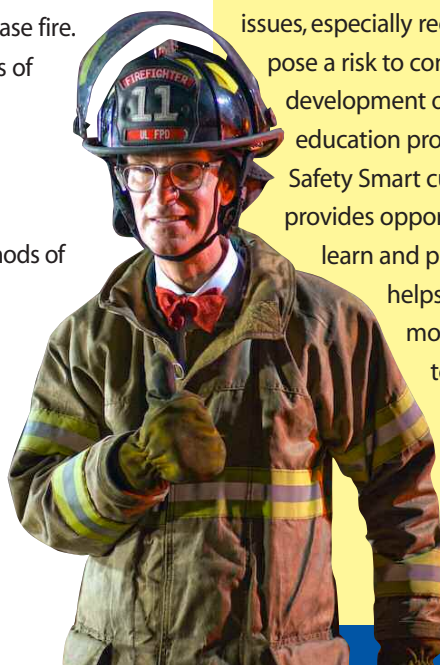
Students will:

- Develop and illustrate a motto relating to fire science.
- Create and act out the dialogue for a talk show segment about fire science.
- Design a public service announcement about how to put out a grease fire.
- Work in teams to write and act out a story about the three methods of heat transfer.
- Write a rap song or poem about the ways to control fire.
- Brainstorm different ways to say, "Get down and get out."
- Put on a skit about fire science.
- Describe, illustrate, and identify common examples of the three methods of heat transfer.
- Develop a fire escape plan by drawing and labeling a map to scale.
- Hold a debate about whether homes should be required by law to have fire sprinklers installed.
- Describe the three degrees of burns and appropriate first-aid treatment for each.
- Research and present information about turnout gear.
- Work cooperatively to research and present information about prescribed fires.
- Develop a public service announcement about fire extinguishers.



Safety Smart is an initiative aimed at improving the awareness and understanding of children ages 4-14 in safety and in managing themselves and their surroundings as safely as possible—by conscious action, not chance. Toward that end, Underwriters Laboratories, UL, produces multimedia public service announcements; arranges for Safety Ambassadors' visits for children to learn from professional safety experts; hosts field trips to its laboratories, where students see safety engineers at work and participate in their own hands-on safety experiments; regularly takes a public stance on emerging safety issues, especially regarding products that may pose a risk to consumers; and supports the development of its youth safety education programs. Through its efforts, Safety Smart cultivates safety awareness, provides opportunities for children to learn and practice safe behaviors, and helps children learn to make more informed safety choices today and in the future.

Do your part!
Be **Safety Smart!**



Academic Standards Chart

DVD or Activity		Arts Education (Natl. Arts Education Assns.)	Language Arts (NCTE)	Science (NSTA)	Social Studies (NCSS)
DVD Content		None addressed.	None addressed.	B. Physical Science F. Science in Personal and Social Perspectives	None addressed.
Activity	Mighty Mottos	Visual Arts 1. Understanding and applying media, techniques, and processes Visual Arts 3. Choosing and evaluating a range of subject matter, symbols, and ideas	4. Students adjust their use of spoken, written, and visual language... 6. Students apply knowledge of language structure... 11. Students participate as knowledgeable, reflective, creative, and critical members...	B. Physical Science	None addressed.
	Next on "Who's Hot?!"	Theater 1: Script writing by the creation of improvisations and scripted scenes based on personal experience and heritage, imagination, literature, and history Theater 2: Acting by developing basic acting skills to portray characters who interact in improvised and scripted scenes	4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure... 11. Students participate as knowledgeable, reflective, creative, and critical members...	B. Physical Science F. Science in Personal and Social Perspectives	None addressed.
	Grease Fire Facts	Visual Arts 1. Understanding and applying media, techniques, and processes Visual Arts 3. Choosing and evaluating a range of subject matter, symbols, and ideas	4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure...	B. Physical Science	None addressed.
	Once Upon a Hot Dog Oven	Theater 1: Script writing by the creation of improvisations and scripted scenes based on personal experience and heritage, imagination, literature, and history Theater 2: Acting by developing basic acting skills to portray characters who interact in improvised and scripted scenes Visual Arts 3. Choosing and evaluating a range of subject matter, symbols, and ideas	4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure...	C. Life Science F. Science in Personal and Social Perspectives	None addressed.
	In Control	None addressed	4. Students adjust their use of spoken, written, and visual language... 5. Students employ a wide range of strategies as they write... 6. Students apply knowledge of language structure... 11. Students participate as knowledgeable, reflective, creative, and critical members...	B. Physical Science F. Science in Personal and Social Perspectives	None addressed.
	a.k.a. Get Down and Get Out	None addressed.	4. Students adjust their use of spoken, written, and visual language... 6. Students apply knowledge of language structure... 9. Students develop an understanding of and respect for diversity in language use...	F. Science in Personal and Social Perspectives	None addressed.
	An Alarming Skit	Theater 1: Script writing by the creation of improvisations and scripted scenes based on personal experience and heritage, imagination, literature, and history Theater 2: Acting by developing basic acting skills to portray characters who interact in improvised and scripted scenes	4. Students adjust their use of spoken, written, and visual language... 11. Students participate as knowledgeable, reflective, creative, and critical members...	B. Physical Science	None addressed.

(continued)

Academic Standards Chart (Continued)

DVD or Activity	Arts Education (Natl. Arts Education Assns.)	Language Arts (NCTE)	Science (NSTA)	Social Studies (NCSS)
Activity	Heat Transfer	Visual Arts 3. Choosing and evaluating a range of subject matter, symbols, and ideas	<p>4. Students adjust their use of spoken, written, and visual language...</p> <p>5. Students employ a wide range of strategies as they write...</p> <p>6. Students apply knowledge of language structure...</p>	<p>B. Physical Science</p> <p>None addressed.</p>
	Fire Escape Plan	None addressed.	<p>4. Students adjust their use of spoken, written, and visual language...</p>	<p>F. Science in Personal and Social Perspectives</p> <p>None addressed.</p>
	A Fiery Debate	None addressed.	<p>4. Students adjust their use of spoken, written, and visual language...</p> <p>11. Students participate as knowledgeable, reflective, creative, and critical members...</p>	<p>B. Physical Science</p> <p>F. Science in Personal and Social Perspectives</p> <p>V. Individuals, Groups, & Institutions</p> <p>VI. Power, Authority, & Governance</p>
	Three Degrees	None addressed.	<p>3. Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts.</p> <p>4. Students adjust their use of spoken, written, and visual language...</p> <p>5. Students employ a wide range of strategies as they write...</p> <p>6. Students apply knowledge of language structure...</p> <p>7. Students conduct research...</p> <p>8. Students use a variety of technological and informational resources...</p>	<p>B. Physical Science</p> <p>F. Science in Personal and Social Perspectives</p> <p>None addressed.</p>
	The Science Behind Turnout Gear	None addressed.	<p>3. Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts.</p> <p>4. Students adjust their use of spoken, written, and visual language...</p> <p>5. Students employ a wide range of strategies as they write...</p> <p>6. Students apply knowledge of language structure...</p> <p>7. Students conduct research...</p> <p>8. Students use a variety of technological and informational resources...</p>	<p>B. Physical Science</p> <p>F. Science in Personal and Social Perspectives</p> <p>II. Time, Continuity, & Change</p>
	Prescribed Fire	None addressed.	<p>3. Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts.</p> <p>4. Students adjust their use of spoken, written, and visual language...</p> <p>5. Students employ a wide range of strategies as they write...</p> <p>6. Students apply knowledge of language structure...</p> <p>7. Students conduct research...</p> <p>8. Students use a variety of technological and informational resources...</p>	<p>B. Physical Science</p> <p>C. Life Science</p> <p>F. Science in Personal and Social Perspectives</p> <p>III. People, Places, & Environments</p> <p>VII. Production, Distribution, & Consumption</p>
	ABCs of Fire Extinguishers	<p>Theater 1: Script writing by the creation of improvisations and scripted scenes based on personal experience and heritage, imagination, literature, and history</p> <p>Visual Arts 1. Understanding and applying media, techniques, and processes</p> <p>Visual Arts 3. Choosing and evaluating a range of subject matter, symbols, and ideas</p>	<p>3. Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts.</p> <p>4. Students adjust their use of spoken, written, and visual language...</p> <p>5. Students employ a wide range of strategies as they write...</p> <p>6. Students apply knowledge of language structure...</p> <p>7. Students conduct research...</p> <p>8. Students use a variety of technological and informational resources...</p>	<p>B. Physical Science</p> <p>F. Science in Personal and Social Perspectives</p> <p>None addressed.</p>

Preview Questions

1. In what ways is fire helpful?
2. What are the necessary ingredients to start and maintain a fire?
3. What should you do when a fire starts?
4. What is a home fire escape plan?

Postviewing Questions

1. What are three ways to put out a fire?
2. What are the three ways heat is transferred?
3. Why should you get down and get out when a fire starts?
4. Why is smoke deadly?

Interactive DVD Activities

These activities are designed to accompany relevant video clips. To access and view the related clips, select Scene Selections from the main menu of the DVD. Then select the scenes referenced in each activity below.

Mighty Mottos:

[Scene 1: It's Fire!] During this scene, Bill states the UL motto. A motto is a phrase that expresses a belief. Mottos are often in Latin, but they don't have to be. Work in teams to come up with a motto relating to fire science. Create a poster presentation that displays your motto and a picture illustrating its meaning.

Next on "Who's Hot?":

[Scene 5: Chemical Reaction] Watch the "Who's Hot?" talk show. On this episode of "Who's Hot?" Mr. Flame represents the chemical reaction that occurs when fuel heats up, releasing flammable gases that react with oxygen. Working with a partner, write a script for the next segment of the talk show. First, choose the guest—heat, fuel, oxygen, or smoke. Then write the dialogue between your chosen guest and the host of "Who's Hot?" Act out your segment for the class.

Grease Fire Facts:

[Scene 3: Fuel] Watch the Cucina segment on putting out a grease fire. Then, design a public service announcement that educates consumers about how to put out a grease fire.

Once Upon a Hot Dog Oven:

[Scene 2: Heat] View the scene with the hot dog oven. Then, work in teams to write and act out a story about the three methods of heat transfer: conduction, convection, and radiation.

In Control:

[Scene 1: It's Fire!] Watch the scene with the 3 crib fires. Then, write a rap song or poem about the ways to control fire.

Suggested Classroom Activities

a.k.a. Get Down and Get Out

Using the worksheet provided, have students work in teams to brainstorm as many different ways as possible of saying, "Get down and get out." They might translate the phrase into other languages, as well as come up with other catchy phrases that mean the same thing, such as, "Get low and go."

An Alarming Skit

Divide students into teams of three students each. Have each team put on a skit about fire science by portraying the following characters: Heat, Fuel, and Oxygen. Assign each team one of the following scenarios to act out:

- A fire starts.
- Flashover occurs.
- A fire gets put out by removing the oxygen.
- A fire gets put out by removing the fuel.
- A fire gets put out by removing the heat.



Heat Transfer

Have students use the worksheet provided to describe, illustrate, and identify common examples of the three methods of heat transfer.

Fire Escape Plan

Have students use the worksheet provided to make a fire escape plan for their home, school, or another place they visit (such as the library, sports complex, shopping center, and so on).

A Fiery Debate

Fire sprinklers work so fast that they often put out a fire before firefighters arrive, saving both property and lives. Have students do research on fire sprinklers and then hold a debate about the following topic: "All homes should be required by law to have fire sprinklers installed." See the Resources section of this guide for helpful websites to aid in student research.

Three Degrees

Have students use the worksheet provided to describe the three degrees of burns and identify appropriate first-aid treatment for each.

The Science behind Turnout Gear

Have students do research to learn about the protective gear worn by firefighters. They might present their research findings in the form of a poster or slideshow presentation. See the Resources section of this guide for helpful websites to aid in student research.

Have students answer the following questions in their presentations:

- Why is a firefighter's protective gear called "turnout gear"?
- How has turnout gear changed over time?
- Why is turnout gear designed the way it is? What functions does it serve?
- In what ways does a wildland firefighter's gear differ from gear worn by urban firefighters?
- How is turnout gear tested to make sure it protects the firefighter?

Prescribed Fire

Use the jigsaw method to have students research and present information about prescribed fire. Jigsaw is a cooperative learning method in which each member of a home team joins an expert group to become knowledgeable about a topic. Experts on like topics work together to do research, then meet with their home teams to share their research findings. See the Resources section of this guide for helpful websites to aid in student research.

Assign groups of four students to home teams. Describe the activity, then assign one person from each home team to an expert group to research one of the following topics:

- What is prescribed fire? Why is it used? What are the pros and cons of prescribed fire?
- How is a prescribed fire planned and executed?
- Fire and ecology: How does fire help plants and animals?
- Fire management policies around the world

After expert groups complete their research, have students meet in home teams to create a presentation about prescribed fire that includes research findings about all four topics.

ABCs of Fire Extinguishers

Have students use the worksheet provided to collect information about types of fire extinguishers and how to use them safely. Then divide students into teams to develop a public service announcement about the safe use of fire extinguishers.



Resources

Books

Masoff, Joy. **Fire!** Scholastic Paperbacks, 2002.

Grades 3-7. Masoff describes how fires start and burn, as well as the work of a firefighter. Includes safety tips about fire prevention.

Patent, Dorothy Hinshaw. **Fire: Friend or Foe.** Clarion Books, 1998.

Grades 4-8. Patent discusses the chemistry of fire and demonstrates its benefits to the natural world. Includes information about forest fire management and prescribed fires.

Pringle, Laurence. **Fire in the forest: A cycle of growth and renewal.** Atheneum, 1995.

Grades 4-6. Presents the forest ecosystem before, during, and after a fire in order to illustrate fire's role in maintaining forest health.

Simon, Seymour. **Wildfires.** HarperTrophy, 2000.

Grades 3-5. Alongside photographs of the 1998 Yellowstone National Park wildfires, Simon explains the chemistry of fire, the conditions necessary for extreme wildfires, and how wildfires can be helpful to plants and animals.

DVD

Bill Nye the Science Guy: Chemical Reactions.

Prod. KCTS Seattle. DVD. Disney Educational Productions, 2004.

Grade 5 and up. Bill uses explosive examples to show that everything is made of chemicals and that fire is actually a chemical reaction.

Bill Nye the Science Guy: Phases of Matter.

Prod. KCTS Seattle. DVD. Disney Educational Productions, 2004.

Grade 5 and up. Bill takes a tour of a steel mill to demonstrate that matter exists in three phases: solid, liquid, and gas.

Internet

Resources for use with activities and student worksheets:

Bugwood

(Helpful research for the activity titled, **Prescribed Fire**)

<http://www.bugwood.org/pfire/>

Firefighter Protective Clothing Tour

Tour (Helpful research for the activity titled, **The Science behind Turnout Gear**)

<http://www.ci.davis.ca.us/fire/pct/>

Home Fire Sprinkler Coalition

(Helpful research for the activity titled, **A Fiery Debate**)

<http://www.homefiresprinkler.org/Consumer/ConsSprinklersmarts.html>

How Stuff Works (Helpful research for the student worksheet titled, **ABCs of Fire Extinguishers**)

<http://home.howstuffworks.com/fire-extinguisher.htm>

KidsHealth (Helpful research for the student worksheet titled, **Three Degrees**)

http://kidshealth.org/parent/firstaid_safe/emergencies/burns.html

Mayo Clinic (Helpful research for the student worksheet titled, **Three Degrees**)

<http://www.mayoclinic.com/health/first-aid-burns/FA00022>



National Fire Protection Association

(Helpful research for the activity titled, **A Fiery Debate**)
<http://www.nfpa.org/itemDetail.asp?categoryID=276&itemID=18249&URL=Research%20&%20Reports/Fact%20sheets/Home%20fire%20sprinklers>

National Interagency Fire Center (Helpful research for the activity titled, **Prescribed Fire**)
http://www.nifc.gov/preved/comm_guide/wildfire/fire_22d.html

National Park Service (Helpful research for the activity titled, **Prescribed Fire**)
http://www.nps.gov/fire/fire/fir_prescribedfire.cfm

PBS (Helpful research for the activity titled, **Prescribed Fire**)
<http://www.pbs.org/wgbh/nova/fire/>

PBS Escape!
(Helpful research for the activity titled, **The Science behind Turnout Gear**)
<http://www.pbs.org/wgbh/nova/escape/timefire.html>

PBS Fire Wars
(Helpful research for the activity titled, **The Science behind Turnout Gear**)
<http://www.pbs.org/wgbh/nova/fire/firefighter.html>

SmokeyBear.com (Helpful research for the activity titled, **Prescribed Fire**)
<http://www.smokeybear.com/wildfire-science.asp>

Underwriters Laboratories Newsroom (Helpful research for the student worksheet titled, **ABCs of Fire Extinguishers**)
<http://www.ul.com/newsroom/extinguishers/>

Underwriters Laboratories Product Safety Tips (Helpful research for the student worksheet titled, **ABCs of Fire Extinguishers**)
<http://www.ul.com/consumers/extinguish.html>

U.S. Fire Administration
(Helpful research for the activity titled, **A Fiery Debate**)
http://www.usfa.dhs.gov/citizens/all_citizens/home_fire_prev/sprinklers/



Additional Internet Resources

American Red Cross: Fire Prevention and Safety Curriculum
<http://www.redcross.org/disaster/masters/firesafety/start.html>

American Red Cross: Home Fire Safety Fact Sheet
www.alaska.redcross.org/media/home_fire_safety_factsheet_facts_about_fire.pdf

Burn Institute
<http://www.burninstitute.org/>

City of Davis California Fire Department: Firefighter Protective Clothing Tour
<http://www.ci.davis.ca.us/fire/pct/>

FEMA: Fire Safety Curriculum
http://www.fema.gov/kids/firecurr_13.htm

How Stuff Works: How Fire Works
<http://science.howstuffworks.com/fire.htm>

NASA: Microgravity Educator Guide

http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Microgravity_Teachers_Guide.html

Includes information about combustion science and an activity in which students can observe properties of a candle flame in zero gravity.

NASA's Microgravity Science Laboratory: Combustion Physics

http://science.nasa.gov/msl1/combustion_why.htm

National Interagency Fire Center

<http://www.nifc.gov/>

National Park Service: Fire Facts

http://www.nps.gov/fire/educational/edu_stu_firefacts.cfm

National Park Service: Fire in My Backyard

http://www.nps.gov/fire/educational/edu_tea_les_fireinbackyard.cfm

National Park Service: What is Fire?

http://www.nps.gov/fire/educational/edu_stu_whatisfire.cfm

Oregon Fire Marshall's Office

http://oregon.gov/OSP/SFM/FSSC_Middleschool.shtml

PBS: Fire Wars

<http://www.pbs.org/wgbh/nova/fire/>

PBS: Fireworks!

<http://www.smokeybear.com/>

Texas Fire Marshall's Office

<http://www.tdi.state.tx.us/FIRE/fmcurric.html>

Underwriters Laboratories Newsroom: Learn How and When to Use Your Fire Extinguisher

<http://www.ul.com/newsroom/extinguishers/>

Underwriters Laboratories Product Safety Tips: Household Fire Extinguishers

<http://www.ul.com/consumers/extinguish.html>

U.S. Fire Administration for Kids: Discussion Points

<http://www.usfa.dhs.gov/kids/parents-teachers/discuss.shtm>

U.S. Fire Administration: The Nature of Fire

http://www.usfa.dhs.gov/citizens/all_citizens/about_fire.shtm



Heat Transfer

As you learned in the program, heat is a necessary component of fire. During a fire, heat moves away from the flame and into an area that has fresh fuel. Heat moves in one of three ways: conduction, convection, or radiation.

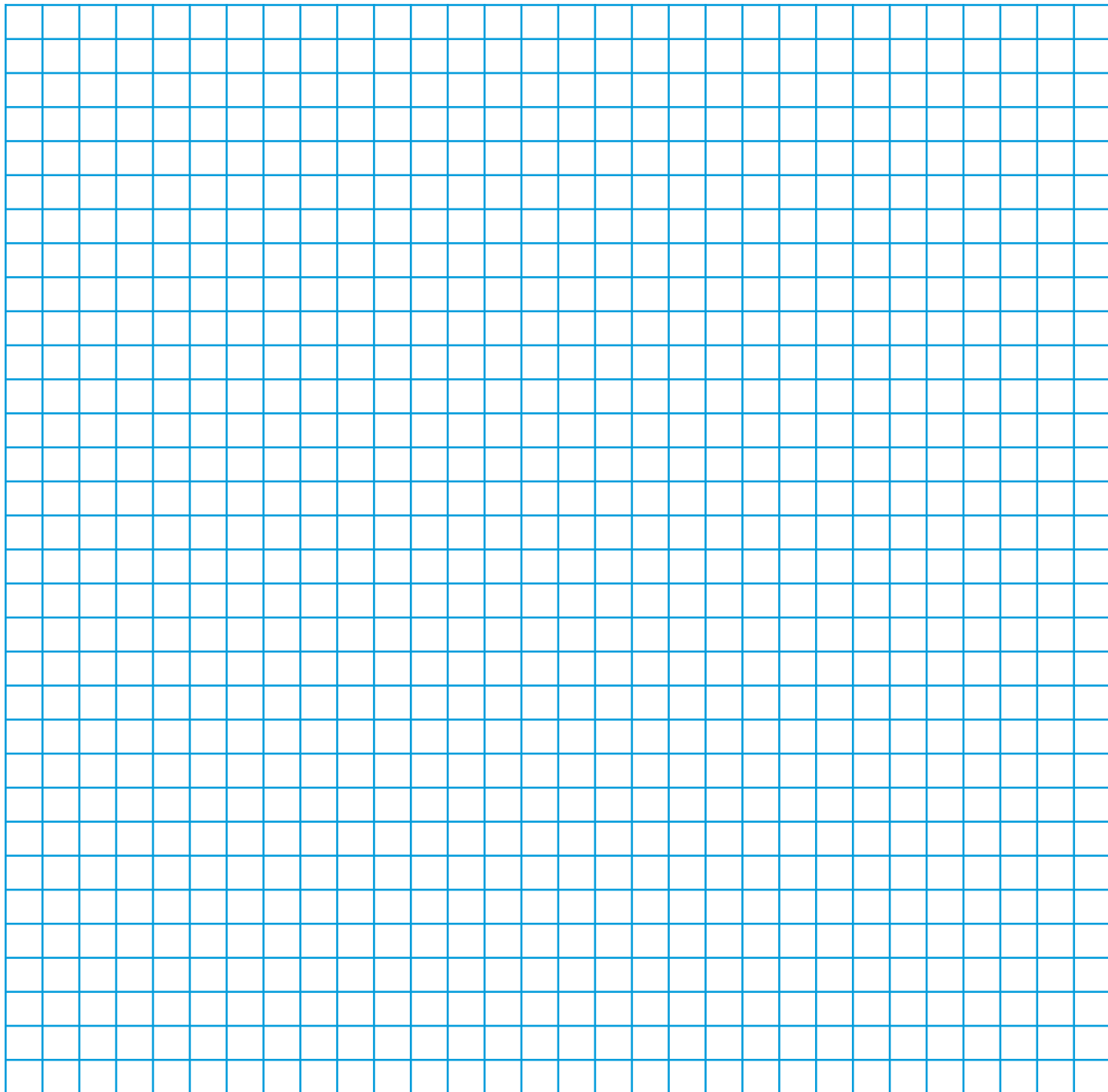
Complete the table below by applying what you learned about heat transfer.

Method of Heat Transfer	Description	Illustration	Common Examples
Conduction			
Convection			
Radiation			

Fire Escape Plan

In the space below, draw a map of your home or a place you visit. If the building has two floors, divide the space into two sections, one for each floor. Indicate the following information:

- two exits from every room, including windows
- locations of every smoke alarm
- an outside meeting place



In the event of a fire, call 9-1-1

Three Degrees

Scalds from hot water. Contact with flames. Too much exposure to the sun. Just as there are different causes of burns, there are different degrees of burns: first-, second-, and third-degree. The extent of damage to the skin tells you what degree a burn is.

Do research about the three degrees of burns. See the Resources section for helpful websites to aid in research.

Type of Burn	Description	First Aid Measures
First Degree		
Second Degree		
Third Degree		

ABCs of Fire Extinguishers

Did you know that there are many kinds of fire extinguishers? See the Resources section for helpful websites to collect information about fire extinguishers and complete the worksheet.

Explain how to operate a fire extinguisher, using language a young child would understand:

Type of Extinguisher	Intended Purpose
A	
B	
C	
D	
ABC	

Group Project: Develop a broadcast, print, or Internet public service announcement (PSA) about the safe use of fire extinguishers. Share your PSA with the class.

Quiz

Name: _____

True or False? Circle T or F

- | | | |
|---|----------|----------|
| 1. A metal pan is not a good conductor of heat. | T | F |
| 2. The shape of a candle flame in space is a teardrop. | T | F |
| 3. Liquid and solid fuel must become a gas in order to burn. | T | F |
| 4. Heat rises. | T | F |
| 5. A fire escape plan should identify two exits for every room. | T | F |
| 6. Smoke stays low. | T | F |
| 7. Heat, fuel, and oxygen are three parts of the fire triangle. | T | F |

Multiple Choice: Circle the letter of the best answer

8. An example of radiated heat is:
- a. heating a hot dog on a frying pan
 - b. the sun's rays reaching our skin
 - c. toasting marshmallows over a fire
 - d. cooking a hot dog in boiling water
9. Smoke fills a room:
- a. Bottom up
 - b. Evenly
 - c. Top down
 - d. Left to right
10. Which of the following demonstrates a way to put out a fire?
- a. pouring water over it
 - b. spreading out the fuel
 - c. removing the oxygen
 - d. all of the above

Quiz Answer Key

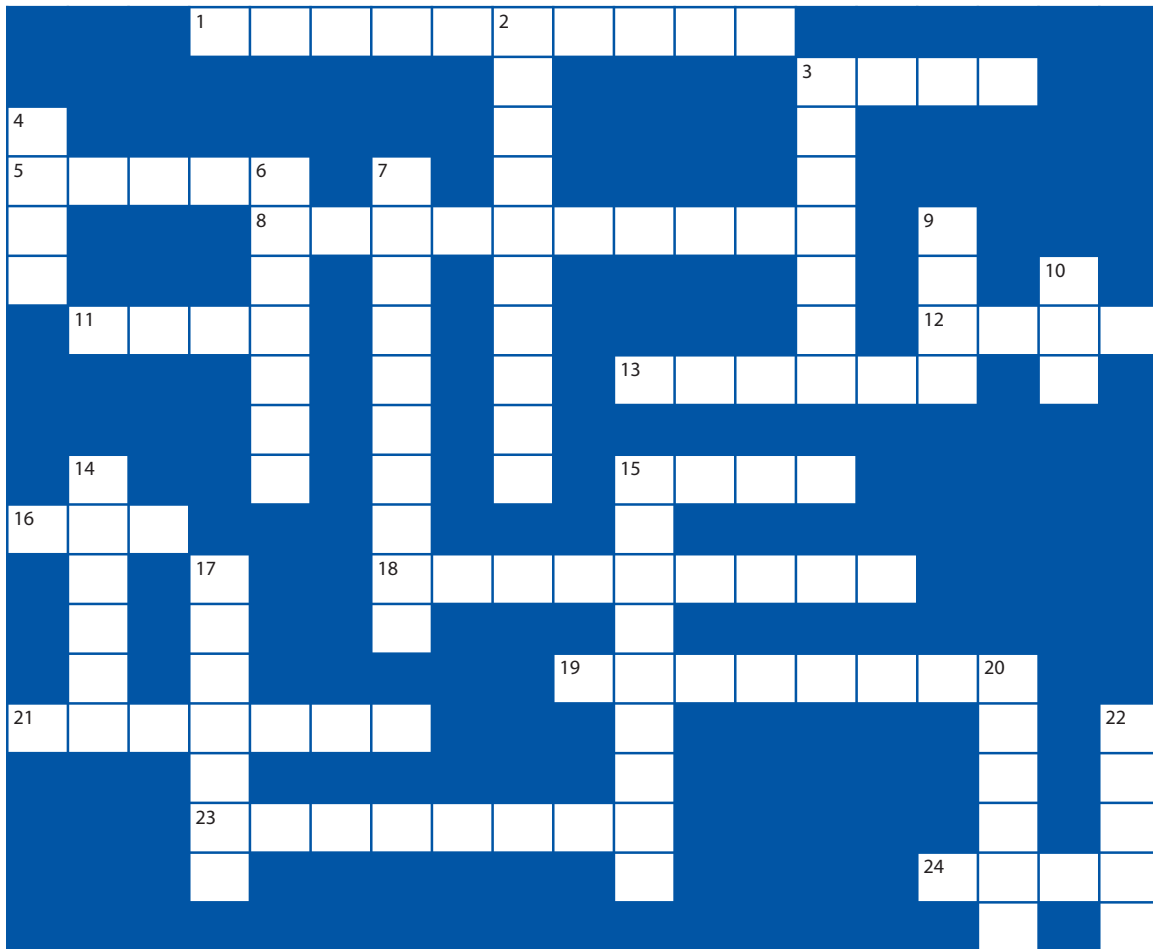
True or False?

- | | |
|---|----------|
| 1. A metal pan is not a good conductor of heat. | F |
| 2. The shape of a candle flame in space is a teardrop. | F |
| 3. Liquid and solid fuel must become a gas in order to burn. | T |
| 4. Heat rises. | T |
| 5. A fire escape plan should identify two exits for every room. | T |
| 6. Smoke stays low. | F |
| 7. Heat, fuel, and oxygen are three parts of the fire triangle. | T |

Multiple Choice

8. An example of radiated heat is:
- b.** the sun's rays reaching our skin
9. Smoke fills a room:
- c.** Top down
10. Which of the following demonstrates a way to put out a fire?
- d.** all of the above

Crossword Puzzle



ACROSS

- 1 The transfer of heat by moving particles of liquid, gas, or air
- 3 The shape of a candle flame in space
- 5 Develop a fire escape plan with two _____ from every room
- 8 The chemical reaction that creates fire
- 11 In a fire, heat and smoke do this
- 12 When this solid fuel is heated, it releases flammable gases that react with oxygen and ignite
- 13 To put out a fire, remove this
- 15 To put out a fire, you can spread this out
- 16 Fire happens when fuel heats up, turns into a _____, and reacts with oxygen in the air
- 18 The transfer of heat through invisible electromagnetic waves
- 19 Heat, fuel, and oxygen create a _____ reaction
- 21 Fire is _____, not master
- 23 Oxygen, fuel, and heat are three elements in the fire _____.
- 24 By understanding the fire triangle, we can control this

DOWN

- 2 When heat is transferred through a solid surface into another area or thing
- 3 Fire needs oxygen, heat, and fuel to keep it _____
- 4 A necessary element of fire
- 6 Know the _____ and be safety smart
- 7 This dramatically increases your chances of surviving a fire
- 9 If you're in a fire, get _____ and get out
- 10 Fire is fast and _____
- 14 The cause of many devastating home fires
- 15 This occurs when hot smoke radiates heat, causing all surfaces in a room to heat up and release flammable gases that react with oxygen in the air and ignite
- 17 This causes a candle flame on earth to have a teardrop shape
- 20 Fuel can be in this form before it becomes a gas
- 22 Don't put out a grease fire with this

