The Fire Triangle

If young children understand how fires start, they will be better prepared to prevent them.

Key Terms and Concepts

<table>
<thead>
<tr>
<th>burning</th>
<th>fire triangle</th>
<th>heat source</th>
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<tbody>
<tr>
<td>combustion</td>
<td>fuel</td>
<td>oxygen</td>
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<tr>
<td>fire</td>
<td>heat</td>
<td>prevention</td>
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Purposes

To introduce the students to the components of fire and to help the students understand how the components interact to start harmful fires.

To help students understand how to prevent fires by keeping the components of fire separated.

Objectives

The students will—

- Identify the three elements of the fire triangle.
- Use Fire Triangle to create and label their own paper fire triangles.
- Discuss the meaning of and the science behind “fanning a flame.” (Linking Across the Curriculum)
- Go on a school scavenger hunt to find fuel and heat sources for a potential fire triangle.
- Create a bulletin board–size map of the school to illustrate possible areas of combustion and identify ways to prevent fire in these areas.
- Play “what if” to illustrate and solve problems that might cause a fire at school.
- Use Stop Fires Before They Start to identify ways to prevent fires at home. (Home Connection)
- Demonstrate and measure 3 feet (1 meter) to illustrate the reasoning behind the Three-Foot Rule for fire safety. (Linking Across the Curriculum)
Activities
“The Shape of Fire”
“Break the Fire Triangle”

TEACHING NOTE Introduce or reinforce the concept of the fire triangle and breaking the fire triangle with the Fire Prevention and Safety DVD, Grades K–2, Scene 1: “Start,” and Scene 2: “Three Feet Apart.”
**Fire Prevention and Safety K–2**

**LESSON PLAN 1**

The Fire Triangle

**Materials**
- Sidewalk chalk or stick
- Poster board for signs
- Red, yellow and orange construction paper cut into flame shapes
- Tape
- Crayons or markers
- *The Fire Triangle*, 1 copy per student

**“The Shape of Fire”**

**SET UP** 20 minutes; **CONDUCT** two 20-minute sessions

**Science:** Physical Science and Health; **Mathematics:** Classification; **Fine Arts:** Visual Arts

Before you begin; make poster board signs that show or say the following: paper, wood, cloth, cardboard, plastic, flame, spark, lit match, candle, electric cord, heater, stove and air.

1. Go outside and use chalk to draw a large triangle on a paved area. (If no paved area is available, use a stick to draw a triangle in sand or dirt.) Have the children sit in a circle around the triangle. Discuss the shape: How many sides does a triangle have? What happens if you take away one side? Do all the sides have to be the same length?

2. Next, have the students describe flames or fire. Where have they seen flames? What started the flame? What was burning?

3. Tell the students that three things are needed to start and keep a fire burning. Based on the fires they have seen, can they think what those things are? Help them brainstorm to reach the conclusion that you need the following components: something to start the fire (heat), something to burn (fuel) and air to keep the fire going (oxygen). Write these three words along the sides of your large triangle on the ground.

4. Visit the American Red Cross Web site at www.redcross.org/disaster/masters

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**Masters of Disaster** Fire Prevention and Safety, Fire and Fire Prevention, Lesson Plan 1/*The Fire Triangle*  
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Hold up one of the poster board signs and have the students identify on which side of the triangle it belongs.

**Answers**
- **Heat:** flame, spark, lit match, candle, electric cord, heater and stove
- **Oxygen:** air
- **Fuel:** paper, wood, cloth, cardboard and plastic

5. Tell several children that they are going to pretend to be fire. Hand each of them a paper flame shape. Remind them that they can “flame up” only if all three sides of the triangle are filled.

6. Hand a poster board sign to a child at random. Have the student walk to the correct side of the triangle and stand. Continue handing out signs. Each time the triangle is completed, the students with the flames should run into the triangle to “flame up.” As soon as you ask the students on one side of the triangle to sit down, the flames should go away. Switch the sides of the triangle and let the students take turns being the flames.

7. Back in class, distribute *Fire Triangle*. Have the youngsters draw, write and cut to create their own fire triangles. Distribute pieces of red, yellow and orange construction paper so the students can add their own flames. Make sure they are able to explain what would happen to the flames if they took away any part of the triangle.

**Wrap-Up**

Discuss how knowing about the fire triangle helps reduce the risk of fire.

Answers will vary, but listen for statements such as—

- If you know that paper is a fuel source, you will not put it next to a heat source.
- If you know that a spark from an electric cord can start a fire, you will be sure to keep all fuels away from the wall socket.
- If you know that gas is a fuel, then you’ll be sure to store your lawn mower or gasoline can away from a heat source.

**Linking Across the Curriculum**

**Language Arts: Vocabulary; Science: Physical Science**

Discuss what people mean when they say you are “fanning the flames” of an argument? What would fanning real flames do? Why? (It increases the size or strength of the fire by adding more oxygen.)

Next, challenge students to think about the answer to this question: If fanning a flame increases its size, what happens when you blow on a candle? (Sometimes when you blow, the flame actually increases, because you are moving more oxygen to the flame. If you blow hard enough, however, the flame goes out, because you are blowing the flame [the heat source] away from the candle [the fuel source], breaking the fire triangle.)
“Break the Fire Triangle”

SET UP 5 minutes  CONDUCT two 20-minute sessions

Science: Physical Science and Problem Solving; Geography: Mapping

1. Draw a triangle on the board and have the students help you fill in the fire triangle: fuel, heat and air (oxygen).

2. Remind the students that oxygen is everywhere. To be safe, we need to keep fuel and heat sources at least 3 feet (1 meter) away from each other.

3. Then, guide them on a scavenger hunt around the school to identify fuel and heat sources. As the students find the sources, take note of each item and where it was found. Have the students talk about why these sources are safe. (Answers will vary, but may include—Even though there is recycled paper in the plastic bin in the hall, there are no heat sources nearby. The electric cords in the media center are in good condition, but even if they made a spark, there are no fuel sources nearby.)

4. Upon returning to the classroom, help the students create a large map of the school on the bulletin board paper. Include the classrooms, cafeteria, media center, etc.

Wrap-Up

The children will draw the heat and fuel sources they found onto the map and place it on a bulletin board as appropriate.

For each item they add to the bulletin board, make sure the students can explain why it is safe. Why is the fire triangle not completed?

TEACHING NOTE If you cannot take the students on an actual scavenger hunt, tell them to picture different areas of the school in their minds as they go on a “mental scavenger hunt.”

TEACHING NOTE If the students find any areas that could be potential problems, report them immediately to the administration.

Materials

- Chalkboard and chalk or poster paper and markers
- Bulletin board paper and markers
- Stop Fires Before They Start, 1 copy per student (Home Connection)
While the bulletin board is up, play “what if” with the students. For example, if students found recycled papers in a plastic bin in the hall, point to the picture and ask, “What if someone put a heater next to the bin?” (The heat source could heat the plastic and it could melt into the papers and spark a fire.) If there was an electric cord in the media center, ask, “What if someone rolled a chair over the cord and cut it?” (The severed cord could spark, and the carpeting could catch fire.) Talk with the students about ways to prevent the “what ifs” from happening.

**Home Connection**

Distribute *Stop Fires Before They Start* and have the students complete their activity sheets at home with their families.

Question the class about the fuel and heat sources they found in their homes. What were some of the ways their families ensured that these sources were safe?

How do the items on the activity sheet reflect the fire triangle?

**Linking Across the Curriculum**

**Mathematics: Measurement; Science: Physical Science**

For this exercise, use the Fire Prevention and Safety DVD, K–2, Scene 2: “Three Feet Apart.”

Ask the students to demonstrate or describe 3 feet (1 meter) in as many ways as they can. (Answers will vary, but may include—I’m 3 feet tall. I can jump forward 1 foot, so if I jumped three times I’d jump 3 feet. When I stretch my arms out, the distance from fingertip to fingertip is about 3 feet. A meterstick is just a little over 3 feet long.)

Have the students stand on a line in the front of the class and walk what they think is 3 feet (1 meter). Mark where each student stops. Then, use a measuring stick to see who most closely estimated 3 feet (1 meter).

Use the Fire Prevention and Safety DVD to show the music video: “Three Feet Apart,” or explain the Three-Foot Rule: Always keep fuels and heat sources at least 3 feet (1 meter) apart. Have the students use this rule as they go on their safety checks at home or at school. Tell them to use a measuring stick or have them work on estimating 3-foot lengths.
**Directions:** Make your own **Fire Triangle** to show how **fuel**, **heat** and **air** combine to create fire.

1. On the next page, draw pictures or write words to describe fuel sources, heat sources, and air in each area of the fire triangle.

2. Cut along the dotted line.

3. Fold along the bold lines to make a triangle.

4. Tape the triangle together on the back.

5. Decorate the triangle with construction paper flames.
Fire Triangle

Heat

Fuel

Oxygen

Visit the American Red Cross Web site at www.redcross.org/disaster/masters
Directions: Work as a family to answer these questions. Any “no” means there could be a fire hazard in your home.

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<th>YES</th>
<th>NO</th>
<th>Does not apply</th>
<th>Think About It</th>
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<td></td>
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<td>1. Are matches kept in a metal container away from heat and away from children?</td>
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<td>2. Are all matches, cigarettes and cigars carefully extinguished before they are disposed of?</td>
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<td>3. Are the fuses or circuit breakers adequate for your home?</td>
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<td>4. Are all electrical cords kept in good condition—not frayed or worn?</td>
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<td>5. Are extension cords kept out from under rugs and carpets and off nails and pipes?</td>
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<td>6. Is only one appliance or device plugged into an extension cord?</td>
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<td>7. Is the heating system in your home inspected annually?</td>
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<td>8. Are furnaces and stoves properly maintained?</td>
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<td>9. Are your fireplace, flue and chimney inspected and cleaned regularly?</td>
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<td>10. Is there a screen on your fireplace?</td>
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<td>11. Are areas above the stove kept clear?</td>
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<td>12. Are curtains and clothing kept away from the stove and heaters?</td>
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<td>13. Are objects that can burn, like recipe books, paper towels, and potholders kept far away from the stove?</td>
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<td>14. Are the stove, broiler and other cooking equipment kept clean and free of grease?</td>
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<td>15. Are spaces around the water heater and furnace free from flammable/combustible materials and liquids?</td>
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<td>16. Are gasoline and other flammable liquids kept in approved safety containers and not in glass or plastic containers?</td>
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<td>17. If candles are used in your home, do you make sure they are kept away from anything that can burn? Do you make sure to never leave lighted candles unattended?</td>
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<td>18. Do all members of your family know they should not put cloth over lamps or light bulbs?</td>
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