The term juvenile fire-setter conjures up a troubled adolescent. But in fact, one in four fires are set by children age six and under. That is the finding of more than 20 years of research by Fireproof Children Company in Rochester, New York (Cole et al. 1986; Cole 1994), and it is borne out by findings in other cities that have systematically kept such data. The most recent data include 309 consecutive fire incidents involving 417 children reported to the Rochester Fire Department between May 2001 and May 2003. Similar findings are reported by Portland, Oregon, which has kept data on juvenile fire-settings for the past 12 years (Porth 2002).

In the past 20 years, the number of fires started by children in the United States has fallen sharply (Hall 2003) due to community fire prevention campaigns, new classroom fire safety programs, the child-resistant lighter standard, and other factors. But children still start more than 67,000 fires every year, resulting in some 2,800 injuries and 350 deaths (Hall 2003). Worse, 90 percent of those who die in fires started by children are children (Cole, Crandall, & Bills 1999).

Fires set by preschool children are often the most tragic. The chance of death in a fire started by a preschool child is 27 times greater than in a fire started by a child five or older (Hall 2003). Why? Young children start fires almost exclusively in the home, most often in their own bedrooms (Hall 2003), where they spend much of their free time and where a fire may be undetected by adults for some time.

Clearly, we need to teach preschoolers fire safety skills that could prevent tragedy. At the same time, we also must recognize the special challenges involved in teaching young children these skills.

Challenges in teaching young children about fire

First, young children have a very poor understanding of the risks posed by fire, because it is such a familiar and apparently friendly companion to daily life. A child’s first experience with fire is usually the candles on a birthday cake or the campfire at a family outing. Young children associate fire with food, comfort, and fun. They think

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it’s easy to control. After all, a child can blow out those birthday candles with a single breath—and is applauded for doing so! Many children also see adults struggling to start a fire with wet wood or old charcoal, often in uncooperative fireplaces, and these observations leave them with the impression that fires are hard to start and easy to stop.

Second, young children lack the cognitive abilities to understand that a tiny flame can become a blaze that burns down a whole house. Preschool children may understand simple cause and effect, but not more complex consequences. They cannot imagine the chain of events that can go from a single lit match to a raging house fire. They often don’t know that everyday household items, such as drapes and wallpaper, will burn. Even many adults don’t realize how rapidly fire can spread.

In one study (Grolnick et al. 1990) conducted by our team at Fireproof Children, an international fire safety and prevention center, we asked elementary school children in Rochester what one match could burn up. All the children understood that one match could burn a piece of paper. But when asked about toys, furniture, and houses, the youngest children were not so sure. When asked if a match could burn up a house, fewer than half of the six-year-olds believed it could.

Finally, the challenge of keeping young children from indulging in fire play is complicated by adult perceptions and actions. Many adults, believing “out of sight, out of mind,” are casual about securing matches, keeping them instead in an unlocked drawer or cupboard that is easily reached. A child who becomes interested in matches or lighters can find them. In a sample of 771 Rochester City School District elementary school children, 48 percent reported they had ready access to matches—that they could “get one if they wanted to” (Cole et al. 1986). In two-thirds of the cases reported to the Rochester Fire Department, investigators noted that matches and lighters were “always available” to children—even after a fire.

Educating parents and other adults about making these items inaccessible to children is obviously important in preventing child-set fires. But children must be taught what to do if they do come across such materials.

### A fire-safety program for preschoolers

Fireproof Children, with the BIC Corporation and others, assisted in the development of a preschool program called play safe! be safe! The program focuses on actions in two areas: keeping children safe in a fire (go to the firefighter; crawl low under smoke; stop, drop, and roll) and preventing fire play by substituting an action that is incompatible with play (go tell a grown-up).

Teaching actions gives children something they can do—not just something they can’t—and is particularly effective in prevention. Children are eager to go tell a grown-up if they see matches or lighters left out, because they love having the job of helping to keep their families safe. They also love telling adults something when they know they’re right! This positive reinforcement gets children to cooperate with fire
safety rules more effectively than simply telling them, “Don’t play with fire.”

The content of the lessons developed to teach these actions is described next.

**Lesson content**

1. **My Friend the Firefighter**

   *Objective:* Teach children to go to the firefighter in an emergency.

   Young children can be frightened by the sight of a firefighter in full gear, yet in an emergency it is essential that children know to go to the firefighter rather than run or hide. This lesson reduces anxiety by familiarizing children with the items firefighters wear, and why. It also stresses the importance of going to a firefighter who is wearing these special clothes.

2. **Crawl Low under Smoke**

   *Objective:* Teach the safest method for getting out of a room filling with smoke.

   Children learn to get down on their hands and knees, keep their heads up, and crawl to the outside if a room is filling with smoke.

3. **Stop, Drop, and Roll**

   *Objective:* Teach the safest way for children to act if their clothes catch fire.

   When clothing catches fire, the natural instinct is often to run, an action that makes the fire spread faster. Children learn to stop, cover their faces, get down on the ground, and roll from side to side until they smother the fire.

4. **Go Tell a Grown-up**

   *Objective:* Teach children that matches and lighters are tools for adults only.

   Children learn that matches and lighters—just like power tools or automobiles—are tools that only adults use. They are not to be played with; indeed they are not to be touched. When children find a match or lighter, they are not to touch it and should tell a grown-up immediately.

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**The play safe! be safe! Program**

Fireproof Children Company is an international fire-safety education and prevention center based in Rochester, New York. Under the sponsorship of the BIC Corporation, Fireproof Children Company and Rowan and Blewitt Services created the *play safe! be safe!* Preschool Program, a multimedia kit including a videotape of four key fire-safety lessons, activities, and games.

The BIC Corporation underwrites the dissemination of the *play safe! be safe!* education kit and each year funds eight fire safety workshops for child care professionals. The workshops focus on the developmental psychology of children’s fire play, such as poor understanding of the risks of fire and lack of cognitive abilities to understand a complex chain of events.

The workshops also explain the best use of the *play safe! be safe!* education kit. Every participant receives a program kit at no charge.

To apply for a fire safety workshop in your community, or to learn more about the program, call 585-385-3370, e-mail playsafe@fireproofchildren.com, or visit www.playsafesusafe.com.

An Internet version of the *play safe! be safe!* card game (for ages three and up) is available at www.keepawaygame.com, and the entire selection of program activities and games is available at www.playsafesusafe.com.

The *play safe! be safe!* kit is available for a $12 shipping fee.
Evaluating the program

The **play safe! be safe!** program was evaluated for effectiveness in teaching these lessons, involving 109 children from 13 preschool classrooms (8 receiving the program and 5 serving as controls). The sample included an equal number of three-, four-, and five-year-olds.

The classrooms were randomly selected from six early childhood programs representing a range of demographics: urban and suburban, low income and middle class, Black and White. Most participating teachers had morning and afternoon classes, and one class was randomly selected to receive the program.

Teachers received the **play safe! be safe!** kit, which includes a video, activities, and a resource book. The kit also includes a brief overview of research about children and fire, objectives of the program, program protocol, and protocol for each lesson. The teachers used the program for one month, introducing one new lesson each week.

The evaluation used a posttest only. It was believed that pretesting children about their knowledge might motivate them to ask their parents and teachers these questions. The pretest would thus act as an intervention, and the evaluation would underestimate the overall impact of the program.

Two weeks after completion of the program, an evaluator from Fireproof Children visited each classroom. After some general ice-breaking activities and conversation, each child was individually interviewed. The evaluators asked children several questions and asked them to demonstrate two skills: Stop, Drop, and Roll and Crawl Low under Smoke.

The following are children’s responses to questions pertaining to each of the above lessons. All comparisons between the responses of children who received the program and the children who did not (the control group) are statistically significant, with a probability of these results occurring by chance less than .001.

1. **My Friend the Firefighter**

   Evaluators asked each child to describe some things that firefighters wear and why. The evaluators then asked, If you saw a firefighter in their special clothes, what would you do?

   - Of the children receiving the program, 76 percent correctly explained why firefighters wear special clothes (for example, to keep safe from fire, to keep from getting hurt), compared to only 10 percent of children in the control classrooms.
   - Further, 75 percent of the children receiving the program knew that if they saw a firefighter wearing special clothes, they were to go to the firefighter, compared to only 10 percent of the children in the control classrooms.

2. **Crawl Low under Smoke**

   Evaluators asked each child, How would you get out of a room if there were smoke? Can you show me?

   - Of the children receiving the program, 67 percent said, *Crawl low under smoke* and then correctly demonstrated the behavior, compared to just 3 percent of the control children.

3. **Stop, Drop, and Roll**

   Evaluators asked each child, What would you do if fire got on your clothes? Can you show me?

   - Of the children receiving the program, 75 percent correctly responded, *Stop, drop, and roll* and then accurately modeled the behavior. Only 3 percent of the children in the control classrooms could answer the question correctly.

4. **Go Tell a Grown-Up**

   Evaluators asked each child, If you saw a match or a lighter, what would you do? Who would you tell?

   - Of the children receiving the program, 71 percent correctly responded that they would not touch a match or lighter and/or would tell a grown-up, compared to 35 percent of the children in the control classrooms.
The *play safe! be safe!* lessons in action

Fireproof Children has received feedback from teachers and others indicating the effectiveness of the program. One family child care provider who had cosponsored a *play safe! be safe!* workshop reported firsthand experience. Her six-year-old daughter, who had taken part in the program each year since she was three, came inside to tell her parents about a fire at a neighbor’s home. The adults assumed she had simply seen someone barbecuing. However, the child insisted, so they ran outside to discover that a neighbor’s house had caught fire from a grill while the family was inside and unaware of the danger. The child had clearly learned important fire safety rules: she had told a grown-up but not gone near the fire herself—and she had persisted!

Conclusion

Between two-thirds and three-quarters of the children who participated in one presentation of the *play safe! be safe!* program learned each of the lesson objectives, while virtually none of the children in the control groups could answer the questions correctly or perform these skills. Clearly, three- to five-year-olds are capable of understanding these lifesaving skills but will learn them only through a determined effort.

Fireproof Children recommends that the program be used several times during the school year and in classes or centers for three-, four-, and five-year-olds, so that by the time children finish preschool they will have mastered this important information.
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**References**


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