

U.S. Fire Administration TOPICAL FIRE RESEARCH SERIES

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School Fires

FINDINGS

- 61% of school structure fires are arson; 70% of high school fires are arson.
- Fatalities from school fires are rare, but injuries per fire are higher than those of all non-residential structure fires.
- The leading area of fire origin is the school lavatory.
- School fires decrease substantially on weekends and in during the summer break.

Sources: NFPA and NFIRS

Each year in the United States, an average of 5,500 structure fires occur in educational institutions—public, private, and parochial schools where students attend during the day only. These fires are responsible for approximately 125 injuries, fewer than 5 fatalities, and \$50.1 million in fire loss.¹

Fires to the actual structure of educational institutions account for only 43% of fires to these properties. The remaining 57% occur outdoors and generally involve refuse or other items of little value. Therefore, this report addresses only the causes and characteristics of structure fires in schools.

Educational institutions are governed by strict inspection and fire/life safety codes. Most schools built since the late 1970s are required to have sprinkler and other fire/smoke alarm systems. This is a likely explanation why, as shown in Figure 1, fires in schools are less damaging than fires generally. Fires in schools are, however, more injurious than other non-residential structure fires.

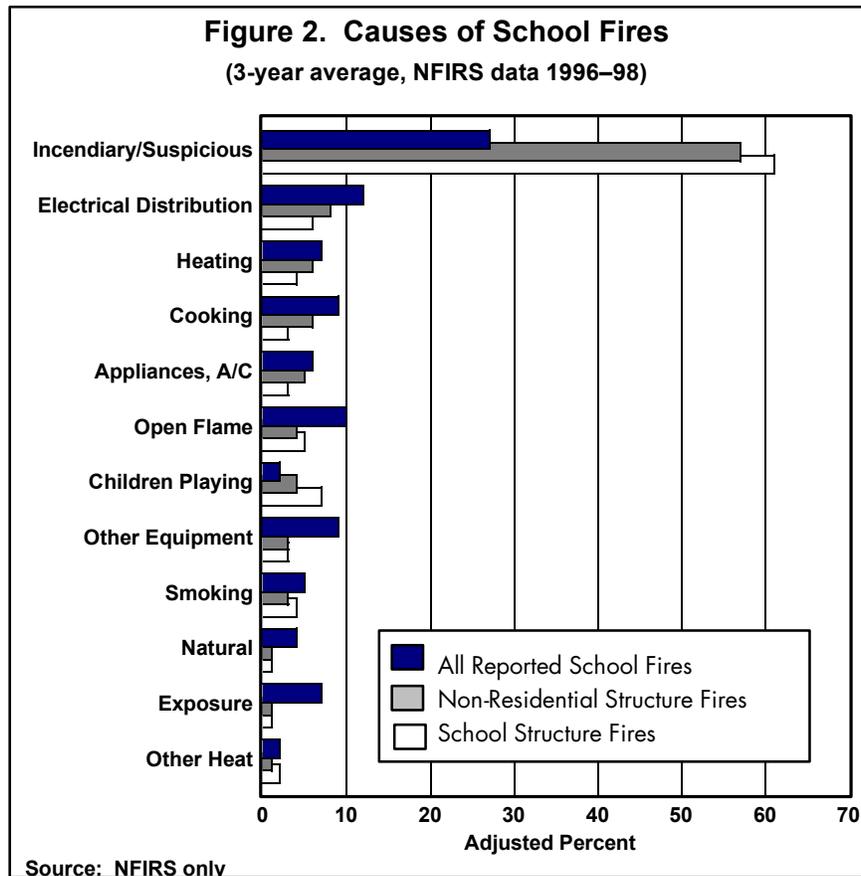
Figure 1. Loss Measures for School Structure Fires
(3-year average, NFIRS data 1996–98)

LOSS MEASURE	ALL NON-RESIDENTIAL STRUCTURE FIRES	SCHOOL STRUCTURE FIRES
Dollar Loss/Fire	\$21,878	\$10,811
Injuries/1,000 Fires	22.1	29.3
Fatalities/1,000 Fires	1.7	0

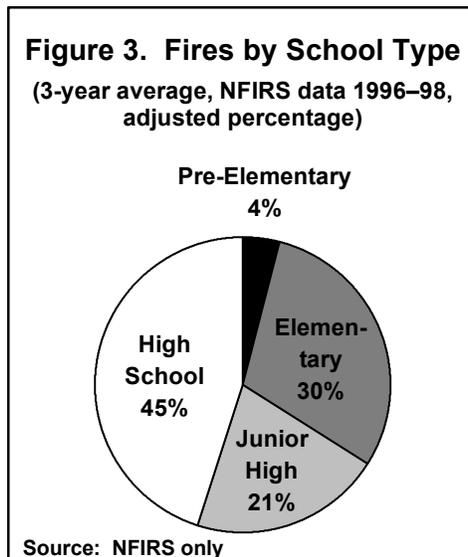
Source: NFIRS only

CAUSES

As shown in Figure 2 the leading cause of school structure fires is incendiary/suspicious (commonly referred to as “arson”), nearly nine times that of any other cause. Leading factors influencing the ignition of school fires are arson, short circuit, and electrical failure. Figure 2 also plots the causes of all school fires (structures and outside). Here, the leading cause remains arson, but children playing follow it, as could be expected with an institution catering to a predominantly juvenile population.



Children may be the ones involved in setting arson fires in schools, but this cannot be determined from NFIRS data. However, the types of schools experiencing structure fires might give some clue as to the age of the children involved in firesetting. As shown in Figure 3, the greatest percentage of fires occur in high schools, followed by elementary schools.

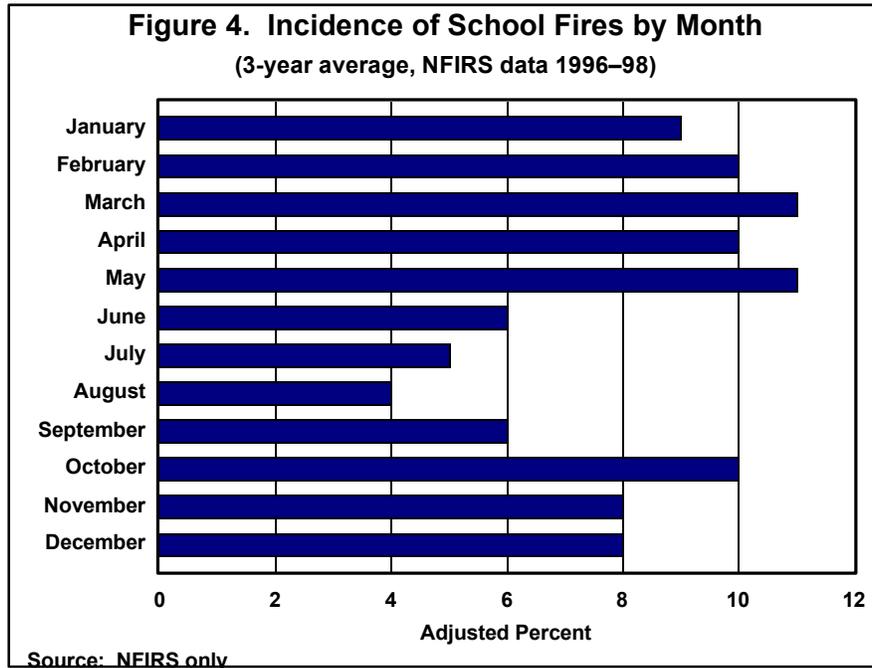


Of fires in high schools, nearly 70% are arson fires, followed by electrical distribution and cooking. For fires in elementary schools, 42% are arson fires, followed by electrical distribution and heating. The higher percentage of arson fires in high schools may indicate that high school students are more likely to engage in suspicious fire setting activities than younger children.

The number of children playing fires (7% of all fires) is troubling, as even under the watchful eye of teachers and school staff, children are still able to access fire-starting materials (generally matches and lighters).

WHEN FIRES START

Figure 4 illustrates the incidence of school fires by month. Peak months are May, March, and October. Fire incidence is lowest in July and August—when students are generally on summer vacations.



Ninety percent of school fires occur during the school week and only 10% on weekends. More than 70% of fires occur between 0800 and 1600, the hours students are most likely to be in school. Sixteen percent of fires occur between 1700 and 2400; 12% occur between 2400 and 0800. This pattern is consistent for all of the major cause categories.

WHERE FIRES START

Figure 5 shows that bathrooms are where the highest percentage of school fires originate. This high incidence may explain the predominance of arson fires. These areas present children with a place to set a fire without having to contend with constant adult supervision.

Figure 5. Leading Areas of Fire Origin in School Fires
(3-year average, NFIRS data 1996–98, adjusted percentage)

AREA OF FIRE ORIGIN	PERCENT OF FIRES
Lavatory	28
Hallway	11
Multipurpose Room	10
Kitchen	6

Source: NFIRS only

WHAT IS IGNITED?

Figure 6 shows the leading types and forms of material first ignited in educational institution fires. These materials are consistent with the materials commonly used by juvenile firesetters. Moreover, all are commonly found in schools.

Figure 6. Type and Form of Materials First Ignited in School Fires
(3-year average, NFIRS data 1996–98, adjusted percentage)

TYPE OF MATERIAL IGNITED	PERCENT OF FIRES	FORM OF MATERIAL IGNITED	PERCENT OF FIRES
Wood/Paper	53	Rubbish/Trash	19
Plastic	16	Magazine, Newspaper	12
Fabric	10	Electrical Wire	10
Natural Product (includes cooking materials)	5	Cooking Materials	4

Source: NFIRS only

EXAMPLES

- In March 2001, two junior high school students set a fire in a lavatory during lunch hour. The school was evacuated and one student was treated for smoke inhalation.²
- In February 2001, an arson fire caused \$250,000 in damage to a school for children with special needs. School was not in session at the time of the fire and no one was injured.³
- In February 2001, a 10-year old using matches ignited a fire in a lavatory. The boy had a history of playing with matches and had been linked to arson fires throughout his neighborhood.⁴

CONCLUSION

Like most fires, those in schools are largely preventable through increased outreach, supervision, and technological innovation. For further information, particularly on juvenile firesetter intervention programs, contact your local fire department or the USFA.

Notes:

1. National estimates are based on data from the National Fire Incident Reporting System (NFIRS) (1996-1998) and the National Fire Protection Association's (NFPA's) annual survey, *Fire Loss in the United States*
2. Philbin, Walt. "Two Boys Booked After Fire Forces School Evacuation," *The Times-Picayune*, March 9, 2001.
3. "School Fire Was Arson," *The Columbus Dispatch*, February 24, 2001.
4. Moran, Kevin. "Fire Set by Pupil Forces School Evacuation," *The Houston Chronicle*, February 2, 2001.

[**CLICK TO REVIEW THE DETAILED METHODOLOGY USED IN THIS ANALYSIS**](#)

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