

TEACHER GUIDES

curriculum connections

Fire in Their Eyes

By Karen Beil
Harcourt Books

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Grade 3 and up

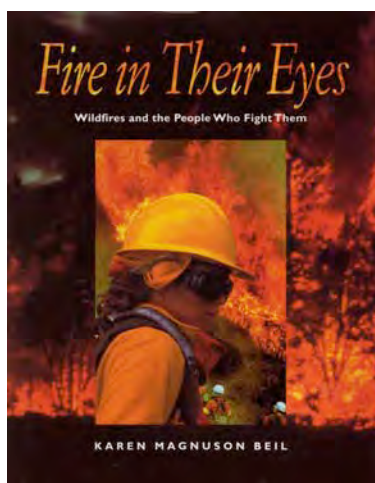
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FIRE IN THEIR EYES:

WILDFIRES AND THE PEOPLE WHO FIGHT THEM

by Karen Magnuson Beil



The book, *Fire in Their Eyes*, can inspire exciting class discussions and projects on many topics, including nonfiction writing, interviewing and journalism, ecological succession, land use planning, mediation of public debate on current environmental issues, citizen activism, and heroism.

This teacher's guide contains interdisciplinary activities which support and connect curriculum in science, language arts, social studies, math, physical education, technology, health, career skills and art.

Before Reading

Talk with your students about whether forest fires impact your area. Discussion starters: Has any class member ever seen a wildfire? Does anyone know a firefighter willing to talk with your class from first-hand experience?

While Reading

This book introduces some new vocabulary. Suggest your students use clues in the surrounding text to decode new words before turning to the dictionary. Specialized terms can be found in the book's glossary.

After Reading

Wildfires are at the center of a continuing heated national debate. In the year 2000, nearly 7 million acres of forest land burned; it was the worst fire season in 50 years. What is causing this upswing in the number and severity of damaging fires? Many blame the buildup of burnable materials in our forests caused by years of quick-attack fire suppression. As a result, our national wildfire policy is being re-examined.

Explore the question: “To burn or not to burn?”

Have students prepare reasoned arguments and counter-arguments. Hold a mock public meeting, playing roles including logger, timber company executive, environmentalist, hiker, student, homeowner, firefighter, birdwatcher, hunter, forester, local mayor, state senator, citizen. For the latest on this issue, see the U. S. Forest Service website, www.fs.fed.us to begin a class exploration of this important debate which directly impacts people, wildlife habitat, and natural resources.



Thanks to these enthusiastic and creative science teachers for contributing their classroom-tested ideas for using *Fire in Their Eyes*:

Christine Cameron, chemistry teacher
Dr. Alan Fiero, science teacher, Farnsworth Middle School,
Guilderland, NY

If you too would like to share how you use my books in your classroom, I'd love to from you! Please email me at karen@karenbeil.com

Fire in Their Eyes

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Science

1. Make a **data table** of the causes, effects, and what finally extinguished the fires in the chapters “Torch!,” “Attack on Morrell Mountain,” “Earth’s Day,” and “Danger Zone.” How did **weather** influence these fires?
2. Invite a **local firefighter** to speak to the class. Have students prepare questions ahead of time. (Examples: What kinds of science classes are firefighters required to take? How do they use science in their work? Ask which landscape plants are most fire-resistant in your area.) Students can write an article on their findings for the school or local newspaper.
3. Investigate whether there are any **endangered plants or animals in your community** (see p. 43-49). Are there programs in which students can help manage a local habitat?
4. Evaluate the decision by fire management officer Maggie Doherty in “Attack on Morrell Mountain,” p. 25-28. List factors she had to consider and her options for types of firefighting teams. In a **mock staff meeting**, decide whether to suppress the fire by debating the pros and cons, and discuss which type of crew or crews to use. Students play roles of people in the chapter, such as fire observer, fire management officer, etc.
5. Identify potential problems with the shelter used by Tracy Dunford’s crew (see “Trapped!”). Draw a **new design** for a fire shelter. Be creative. With a firefighter inside, a shelter looks like a baked potato in foil. Why do firefighters call it a “shake and bake”? Compare the kinds of bonding in aluminum (metallic bonding) and Pyrex (glass, silicon dioxide).
6. Brainstorm “hot things.” Produce a **bar chart** comparing the temperature(s) of a wildfire with other hot things, such as a pizza oven, self-cleaning oven, dry sauna, blast furnace, the sun, other planets, lava, etc. Convert Fahrenheit to Celsius or Kelvin.
7. Analyze the physics principles that make a **parachute** work.
8. In the chemistry lab, conduct a **% hydrate lab** with wood chips instead of a hydrated salt.
9. Like hikers, many fire crews snack on “gorp,” a mixture of peanuts, raisins, and M&Ms. In a chemistry lab, conduct a **calorimetric lab**. Determine the caloric value of each of these foods. Can your students come up with a better combination of high-energy foods?
10. By **plotting latitude and longitude** on a topographic map, simulate smokejumpers finding their way out of a wilderness area. Assign location coordinates and have students find safe routes out on the map.
11. List ways organisms have **adapted to fire**. Example: Roots of some plants survive fire. The hard seed coats of New Jersey Tea open by fire. Blue Lupine grows in areas opened to sunlight by fire. Write a **concept map** showing unique ways organisms might adapt to fire. Encourage creativity and out-of-the-box thinking. Give extra credit for any trait that might increase an organism’s chance for survival, or traits (reasonable, minor changes) that might occur.
12. Draw and label a **diagram of ecological succession** after reading the chapter, “Torch!” Predict what would happen to native organisms in the Albany, NY, Pine Bush Preserve if fires were no longer allowed (Immediate decrease in native populations; gradual replacement by other species.)
13. Draw and label the **food web** (see p. 49). Write or debate arguments, pro and con: Do humans have an obligation to protect the web of life?

Here are some innovative ways to use *Fire in Their Eyes* to launch science lessons, projects, and wide-ranging discussions with your whole class, small groups, or in a home-school setting.

Language arts

how powerful are your words?

Students will experiment using powerful verbs, similes and style elements in creating dramatic nonfiction narratives.

You can use these projects as whole-class activities, for students working independently or with partners, or a combination.

After reading *Fire In Their Eyes*, have students give **book talks** on it and other nonfiction books to other classes.

List the **verbs** in the book's opening. Talk about the verb choices and how they work in conveying information. Have students strengthen a piece of their own writing by highlighting each verb and substituting different verbs to find the most effective ones. Encourage use of a thesaurus.

The **title**, *Fire In Their Eyes*, is an example of "double-entendre" (a phrase with two meanings). What are the meanings? Write titles for other books or reports using double-entendre.

Evaluate how **style elements** of tense, setting, time sequencing, and quotation add suspense and immediacy to this book. Experiment using these style elements in writing a science report.

Each chapter represents many hours of **interviews**. Talk about interviewing. Prepare your students to interview someone in their school, community, or families about a particular event in the past by brainstorming questions.

There are many ways to **write an interview**. Your students could first write the story in the past tense, as the person most likely told about it. They could then rewrite it in the present tense. Ask them what impact the change in tense has on the story. Does it change the pace or intensity of the story?

Examine the use of **similes** in this book. For example, a flame front is described as 2600-degrees F. and "hotter than a blast furnace that melts iron into steel." Why does the author use a simile in addition to a numeric description?

Experiment brainstorming and writing similes to explain and clarify concepts.

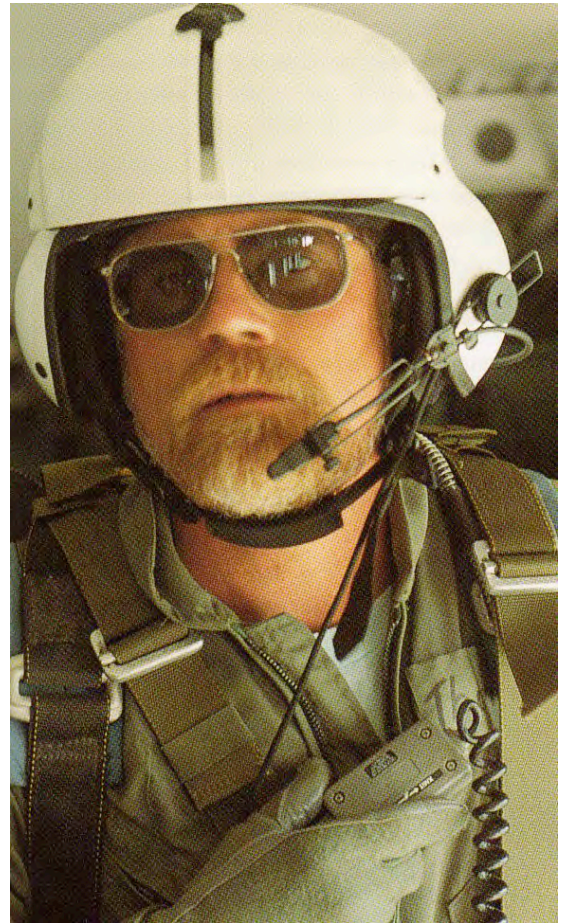


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Social studies

Research famous wildfires, such as The Yellowstone Fires of 1988; The Great Chicago Fire; The Peshtigo Fire; The Black Dragon Fire in China, through library and Internet resources. Using the facts you find, **write news articles** or fictional eye-witness accounts.

Math

The Topanga Fire (“Danger Zone”) **burned at a rate** of 75 acres a minute. Ask students to calculate how long it took to burn an area the size of a football field. Note: A football field measures 300 feet long by 160 feet wide. An acre equals 43,560 square feet.

Physical education

The smokejumper entrance **fitness test** requires: 45 sit-ups, 25 push-ups, 7 pull-ups and a 1.5-mile run in 11 minutes or less. Measure how fast students run.

Technology

Investigate **home fire prevention and safety** information with local experts or through library and Internet resources. Have students discuss these suggestions to their parents.

Design a **new and improved fire shelter**. This multidisciplinary project can involve science, art, technology, health and career skills components.



Students explore the work of wildland firefighters and fire management officers by simulating their fitness test, calculating burn rates, and investigating fire safety practices.

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Career skills

Firefighters use the **Incident Command System (ICS)** to organize the fight against a major fire (see “Danger Zone,” p. 35). Brainstorm comparisons between the fire organization designed there and different kinds of big organizations. Some examples are a newspaper with its writers, editors, photographers, printers, delivery personnel; a school district; or a football team and its supporting staff. Have each student choose an organization and **create an organizational chart** that shows the chain of command and who is responsible for what task. Talk about organization and how it impacts group readiness and response to events or emergencies. Here’s an example. This kind of analogy clarifies the operational concept of the Incident Command System:

- *Incident Commander* supervises the whole operation (like a football coach);
- *Planning Chief* (like an assistant coach) consults specialists to devise a plan to put the fire out;
- *Operations Chief* (like the quarterback) puts the plan to work and directs all the fire crews;

- *Logistics Boss* (like a combination equipment manager and team trainer) arranges for fire gear, tools, trucks, food, and medical attention; and
- *Finance/Administration Chief* (like the team’s general manager) pays bills.

When the “coaches” or “players” become too tired, a new person or crew – rested and already trained – comes in “off the bench” to take over the job.

Health

List possible **health and safety risks** to firefighters. Brainstorm and design new ways to lessen those risks.

Explain why it is so important for firefighters to drink **water** while working.

Art

Evaluate the book's layout, in particular, text placement, photographs, and white space. How would the book's impact change if illustrated with artwork instead of photographs?

Examine the cover illustration (it's a photo-montage prepared digitally). Differentiate the photographs (there are four; two of the photographs are repeated inside). Design a report cover or a CD case using collage or montage.



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inset photo Karen M. Beil

Further reading

Web resources

www.arborday.org Website of the National Arbor Day Association. Arbor Day is on different dates in different states because of regional differences in growing seasons: www.arborday.org/arborday/arbordaydates.cfm. National Arbor Day is the last Friday in April. This is a site full of useful information about trees with specific pages devoted to the states.

www.fs.fed.us The official website of the U. S. Forest Service.

www.smokeybear.com This website for elementary students and teachers has content about the U. S. Forest Service's fire-prevention campaign.

www.sparky.org This National Fire Protection Association website focuses on structural firefighting, rather than wildland fire.

Books for Young Adults

Nonfiction

Maclean, Norman. *Young Men and Fire*. University of Chicago Press, 1993 (also available on audio cassette). Reading this book was one of the inspirations that led to my writing the book, *Fire in Their Eyes*.

Murphy, Jim. *The Great Fire*. Scholastic, 1995.

Pyne, Stephen. *Fire on the Rim: A Firefighter's Season at the Grand Canyon*. University of Washington Press, 1995.

Taylor, Murry. *Jumping Fire: A Smokejumper's Memoir of Fighting Wildfire*. Harcourt, 2001.

Thoele, Michael. *Fireline: The Summer Battles of the West*. Fulcrum, 1995. Excellent, heavily-illustrated book.

Fiction

Ingold, Jeanette. *The Big Burn*. Harcourt, paperback, 2003. An exciting YA novel, based on an actual historical wildfire, told from the perspectives of fictional characters.

Articles & Books for Elementary Students

Storyworks Magazine, Apr/May 2000, excerpt with teachers' edition for *Fire In Their Eyes*.

Ranger Rick Magazine, Sept 2001, full article.

Simon, Seymour. *Wildfires*. Harper, 2003. Paperback. 32 pages.

Booth, Jerry. *Big Bugs*, Harcourt, 1994. Stories of student environmental action projects around the country including one involving Karen Beil. 48 pages.