

Blowup: What Went Wrong at Storm King Mountain

Narrative Nonfiction by Sebastian Junger



Video link at thinkcentral.com

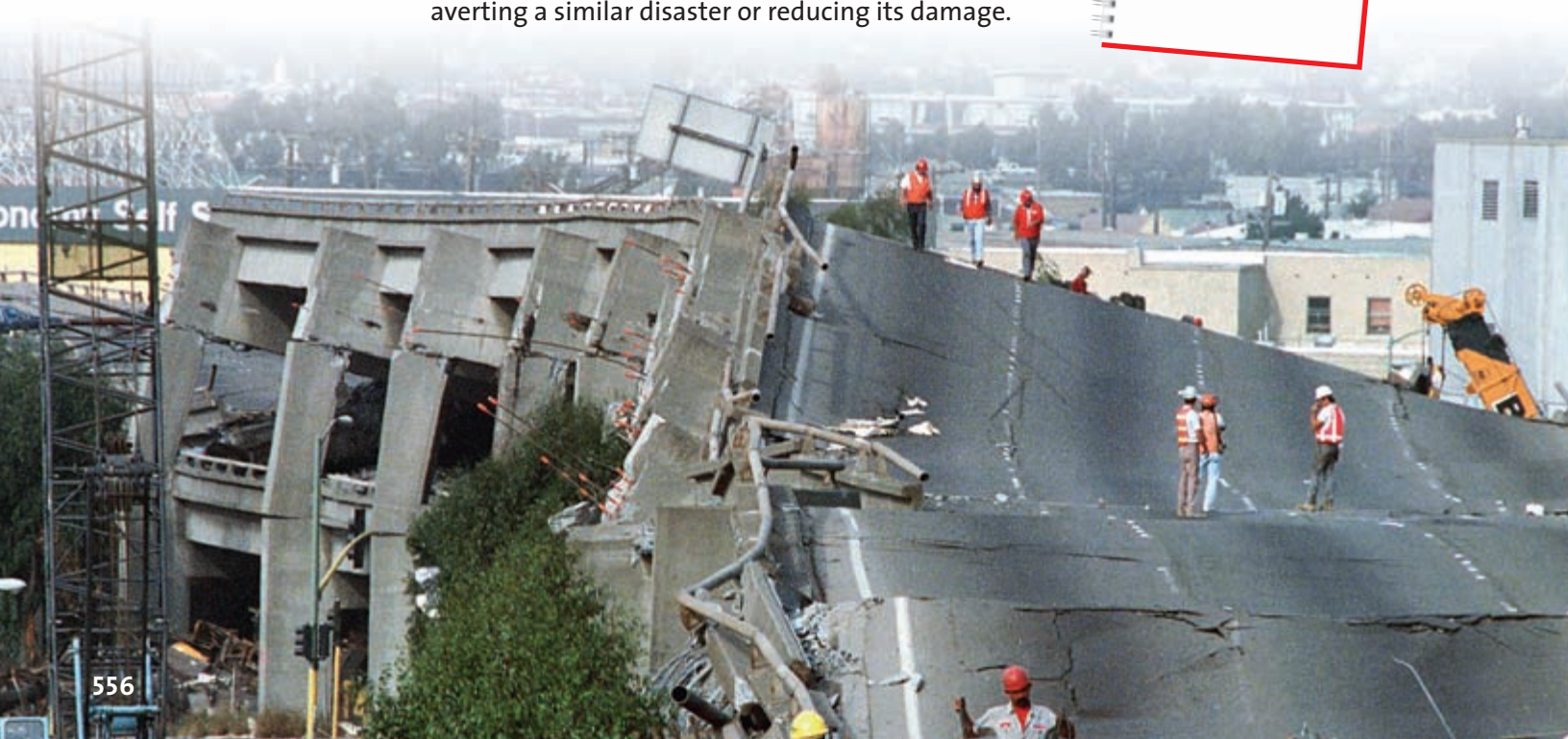
What can we learn from **DISASTER?**

COMMON CORE

RI 3 Analyze how the author unfolds and develops a series of events, the order in which they occur, and the connections drawn between events. **RI 4** Determine the meaning of words and phrases used in a text. **RI 5** Analyze in detail how an author's ideas or claims are developed.

When you hear about a disaster, what's your reaction? Do you pay attention to the details so you can prevent the same thing from happening to you? You wouldn't be alone in trying to learn a lesson from tragedy. People do it all the time—especially those who are paid to risk their lives when disaster strikes. The selection you are about to read is both a description and an analysis of what caused a small wildfire to flare into a deadly blaze, seemingly without warning.

DISCUSS In a small group, discuss a disaster that took lives or caused great damage to property. Note what went wrong and whether the catastrophe might have been avoided. Then write down your group's top two or three recommendations for averting a similar disaster or reducing its damage.



● TEXT ANALYSIS: NARRATIVE NONFICTION

Narrative nonfiction is writing that tells a true story. Just as in a fictional story, the details in narrative nonfiction help bring the characters, settings, and events to life. For example, notice how the details in this passage from “Blowup: What Went Wrong at Storm King Mountain” convey the experiences of one firefighter who was caught in that blaze.

I was roughly one hundred and fifty feet from the top of the hill, and the fire got there in ten or twelve seconds. I made it over the top and just tumbled and rolled down the other side. . . .

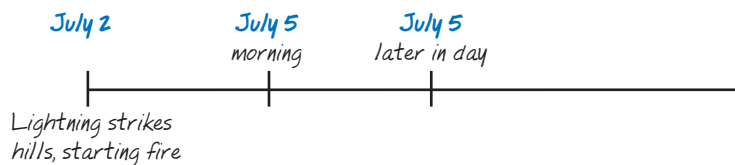
As you read, notice other elements of good storytelling.

● READING STRATEGY: TAKE NOTES

When reading a text that has an obvious method of organization, it’s a good idea to record the key ideas and information in that text on a graphic organizer. Here are some ideal pairings:

- a **timeline** for chronological order
- a **diagram** for spatial order, or position in space
- a **cause-and-effect chain** for cause-and-effect order

Sebastian Junger uses several patterns of organization, with chronological order being particularly important. As you read, record the main events of the disaster on a timeline.



Review: Patterns of Organization, Graphic Aids

▲ VOCABULARY IN CONTEXT

The following boldfaced words help the author deliver his dramatic account of a fire. To see how many you already know, substitute a different word or phrase for each one. Then, in your *Reader/Writer Notebook*, write a definition for each word.

1. **deflect** blame from himself by accusing another
2. a rowdy **contingent** of football players at the hotel
3. forces **conspire** to create tragedy
4. a **conceivably** simple plan that went wrong
5. a **rigorous** course load at school

Sebastian Junger

born 1962

Describing Danger

Sebastian Junger is most famous for his first book, *The Perfect Storm*—a nonfiction account of the *Andrea Gail*, a commercial fishing boat wrecked in an Atlantic storm. Originally, he had intended to write a book about people with dangerous jobs—an idea he got while recovering from a leg injury suffered while climbing trees for a tree-removal company. But a chapter on the *Andrea Gail* turned into a whole volume—and a bestseller.

World-Traveling Journalist

Despite his success as a book author, Junger considers himself a magazine journalist. He has traveled to Kosovo, Sierra Leone, and Afghanistan on assignments for such publications as *National Geographic*. *Fire*, published in 2001, is a collection of his magazine articles. It includes “Blowup: What Went Wrong at Storm King Mountain.” Junger says he felt compelled to write about “situations where people are in one form or another being confronted with forces that are way beyond their control.”

BACKGROUND TO THE SELECTION

One of the biggest firefighting disasters in the United States occurred July 6, 1994, on Storm King Mountain in Colorado. Fourteen firefighters died in a blowup, or sudden explosion of flames, on the windy, dried-out slopes. Today the dead are memorialized with crosses at the spots where they fell and plaques along the route of the fire.

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Complete the activities in your **Reader/Writer Notebook**.

BLOWUP:

WHAT WENT WRONG AT STORM KING MOUNTAIN

Sebastian Junger

The main thing Brad Haugh remembers about his escape was the thunderous sound of his own heart. It was beating two hundred times a minute, and by the time he and the two smoke jumpers¹ running with him had crested a steep ridge in Colorado, everyone behind them was dead.

Their coworkers on the slope at their backs had been overrun by flames that Haugh guessed were three hundred feet high. The fire raced a quarter mile up the mountain in about two minutes, hitting speeds of eighteen miles an hour. Tools dropped in its path were completely incinerated. Temperatures reached two thousand degrees—hot enough to melt gold or fire clay.

10 “The fire blew up behind a little ridge below me,” Haugh said later. “People were yelling into their radios, ‘Run! Run! Run!’ I was roughly one hundred and fifty feet from the top of the hill, and the fire got there in ten or twelve seconds. I made it over the top and just tumbled and rolled down the other side, and when I turned around, there was just this incredible wall of flame.”

Haugh was one of forty-nine fire fighters caught in a wildfire that stunned the nation with its swiftness and its fury. Fourteen elite fire fighters perished on a spine of Storm King Mountain, seven miles west of Glenwood Springs, Colorado. They died on a steep, rocky slope in a fire initially so small that the crews had not taken it seriously. They died while cars passed within sight on
20 the interstate below and people in the valley aimed their camcorders at the fire from garage roofs.

There were many other fire fighters on Storm King when Brad Haugh crested the ridge, yet he feared that he and the two men with him were the only ones on the mountain left alive. That thought—not the flames—caused him to panic. He ran blindly and nearly knocked himself unconscious against a tree. Fires were spotting all around him as the front of the flames chased him. The roar was deafening; “a tornado on fire” was how he later described it. The light, he remembered, was a weird blood-red that fascinated him even as he ran.

Analyze Visuals ▶

How would you feel if you were photographing this scene?

COMMON CORE RI.4

Language Coach

Etymology A word’s history is called its **etymology**. The word *elite*, pronounced /ā lēt/, comes from a Latin word *eligere*, meaning “to pick out or choose.” Reread lines 16–18. Use the etymology of *elite* to figure out its meaning in this sentence.

1. **smoke jumpers:** people who fight forest fires by parachuting to remote locations. Once on the ground, they carry heavy supplies on their backs and hike over rough terrain.

The 1994 South Canyon fire on Storm King Mountain



The two smoke jumpers with him were Eric Hipke and Kevin Erickson.
30 Hipke had been so badly burned the flesh was hanging off his hands in strips. Haugh paused briefly to collect himself, then led the two men about a hundred yards down the mountain, stopping only long enough to wrap Hipke's hands in wet T-shirts. As they started down again, the fire was spreading behind them at a thousand acres an hour, oak, pinyon, and juniper spontaneously combusting² in the heat.

"I didn't have any nightmares about it later," said Haugh. "But I did keep waking up in the night very disoriented. . . ." **A**

The South Canyon fire, as it was called, ignited on Saturday, July 2, as a lightning strike in the steep hills outside Glenwood Springs. At first
40 people paid it little mind because dry lightning had already triggered thirty or forty fires across the drought-plagued state that day; another wisp of smoke was no big deal. But this blaze continued to grow, prompting the Bureau of Land Management³ (BLM) district office in Grand Junction to dispatch a seven-member crew on the morning of July 5 to prepare a helicopter landing site, designated H-1, and start cutting a fire line along a ridge of Storm King. At this point the blaze was cooking slowly through the sparse pinyon and juniper covering the steep drainage below. Glenwood Springs was visible to the east, and a pricey development called Canyon Creek Estates was a mile to the west. Interstate 70 followed the Colorado River one thousand feet
50 below, and occasionally the fire fighters could see rafters in brightly colored life jackets bumping through the rapids. **B**

The BLM crew worked all day, until chain-saw problems forced them to hike down to make repairs. Replacing them were eight smoke jumpers from Idaho and Montana (eight more would be added the next morning) who parachuted onto the ridgetop to continue cutting fire line. They worked until midnight and then claimed a few hours' sleep on the rocky ground.

Just before dawn, on the morning of July 6, Incident Commander Butch Blanco led the BLM crew back up the steep slope. Arriving at the top, Blanco discussed strategy with the smoke jumper in charge, Don Mackey. At about the
60 same time, the BLM office in Grand Junction dispatched one additional crew to the fire, the twenty-member Prineville Hotshots, a crack interagency unit from Oregon whose helmet emblem is a coyote dancing over orange flame.

The smoke jumpers had cleared another landing spot, H-2, on the main ridge, and around twelve-thirty in the afternoon, a transport helicopter settled onto it. The first **contingent** of the Prineville crew ran through the rotor wash and crouched behind rocks as the chopper lifted off to pick up the rest of the unit from below. They'd been chosen alphabetically for the first flight in: Beck, Bickett, Blecha, Brinkley, Dunbar, Hagen, Holtby, Johnson, and Kelso. Rather

A NARRATIVE NONFICTION

What does Junger focus on in this seven-paragraph introduction? Why might he have chosen to begin his nonfiction narrative this way?

B TAKE NOTES

Reread lines 38–51. What is Junger able to convey through a shift back in time? Note events on your timeline.

contingent (kən-tɪn'jənt)
n. a gathering of people representative of a larger group

2. **spontaneously combusting:** self-igniting through an internal chemical action.

3. **Bureau of Land Management:** an agency within the U.S. Department of the Interior, in charge of sustaining the health, diversity, and productivity of public lands.

than wait for their crew mates, these nine hotshots started downslope into the burning valley. **C**

The layout of Storm King Mountain is roughly north-south, with a central spine running from the 8,793-foot summit to H-2. Another half mile south along this ridge was the larger site, H-1. The fire had started on a steep slope below these cleared safe areas and was spreading slowly.

The strategy was to cut a wide firebreak⁴ along the ridgetop and a smaller line down the slope to contain the blaze on the southwestern flank of the ridge. Flare-ups would be attacked with retardant drops⁵ from choppers. If there were problems, crews could easily reach H-1 in five or ten minutes and crawl under their fire shelters—light foil sheets that resemble space blankets and **deflect** heat of up to six hundred degrees.

4. **firebreak**: a natural or constructed barrier used to stop fires that may occur.

5. **retardant drops**: the air-dropping of chemicals to help retard or delay the spread of fire.

C NARRATIVE NONFICTION

What do you learn from Junger's **characterization** of the smoke jumpers?

deflect (dĭ-flĕkt') v. to fend off or avert the direction of something



D GRAPHIC AIDS

Study the graphic shown. What does it tell you about the progress of the fire? What other spatial relationships does it show?

“It was just an ugly little creeper,” the BLM’s Brad Haugh said of the early stages of the fire. Every summer, fire fighters like Haugh put out thousands of blazes like this one all over Colorado; at this point there was no reason to think South Canyon would be any different.

The second half of the Prineville crew dropped onto H-2 around 3:00 P.M. and began widening the primary fire line. Two hundred feet below, Haugh was clearing brush with his chain saw on a 33 percent slope. That meant the ground rose one foot for every yard climbed, roughly the steepness of a sand dune. The grade near the top was closer to 50 percent. He wore bulky Kevlar
90 sawyer’s chaps and a rucksack loaded with two gallons of water weighing fifteen pounds, a folding knife, freeze-dried rations, and some toilet articles. He also carried a folding fire shelter and a Stihl 056 chain saw that weighed ten or twelve pounds. Even loaded down as he was, Haugh could probably have reached the ridgetop in less than one minute if he had pushed it, and H-1 in five or ten minutes. Wildfires rarely spread faster than one or two miles an hour, and the vast majority of fire fighters are never compelled to outrun them—much less fight to survive them. By conventional fire evaluation standards, Haugh was considered safe.

About three-thirty Haugh took his second break of the day. It was so hot he
100 had already consumed a gallon of the water he carried. The fire was burning slowly in the drainage floor, and the crews fighting it—nine from the Prineville unit and twelve smoke jumpers—were several hundred feet below him in thick Gambel oak, some of the most flammable wood in the West.

Around 3:50 Haugh and his swamper—a sawyer’s helper who flings the cut brush off the fire line—were finishing their break when their crew boss announced they were pulling out. Winds were picking up from a cold front that had moved in a half hour earlier, and the fire was snapping to life. They were ordered to climb to the ridgetop and wait it out. **E**

It’s rare for an entire mountainside to ignite suddenly, but it’s not unheard
110 of. If you stand near H-2 and look several miles to the west, you can see a mountain called Battlement Mesa. In 1976, three men died there in a wildfire later re-created in a training video called *Situation #8*. Every crew member on Storm King would certainly have seen it. In *Situation #8*, a crew is working upslope of a small fire in extremely dry conditions. Flames ignite Gambel oak and race up the hill, encouraged by winds. The steep terrain funnels the flames upward, and fire intensity careens off the chart, a classic blowup. Four men are overrun, three die. The survivor, who suffered horrible burns, says they were never alerted to the critical wind shift—an accusation the BLM denied at the time. . . . **F**

120 At about 4:00 P.M. high winds hit the mountain and pushed a wall of flames north, up the west side of the drainage. Along the ridge, the BLM crew and the upper Prineville unit began moving to the safety of H-1. Below them, Don Mackey ordered his eight jumpers to retreat up to a burned-over area beneath H-1. He then started cross-slope to join three other smoke jumpers

E TAKE NOTES

Reread lines 104–108. What happened around 3:50 P.M.? What had happened at about 3:20? Put these events on your timeline.

F NARRATIVE NONFICTION

Reread lines 109–119. Why does Junger break away from the action on Storm King Mountain to give information about the wildfire at Battlement Mesa?

deployed with the Prineville nine. Apparently, no one had advised them that the situation was becoming desperate. In the few minutes it took Mackey to join the twelve fire fighters, the fire jumped east across the drainage. “I radioed that in,” said Haugh. “And then another order came to evacuate.” That order came from Butch Blanco on the ridgeline, who was hurriedly conducting
130 the evacuation. “This was a much stronger warning than the previous one,” recalled Haugh. “I sent my swamper to the ridgetop with a saw and radioed that as soon as the lower Prineville contingent came into sight below me, I would bump up to the safety zone.”

Suddenly, fierce westerly winds drove the fire dangerously close—though still hidden behind the thick brush—to the unsuspecting fire fighters. “The crew was unaware of what was behind them,” said Haugh. “They were walking at a slow pace, tools still in hand and packs in place.” As Haugh watched them, a smoke jumper appeared at his side. “He said that his brother-in-law was down in the drainage, and he wanted to take his picture.”

140 That fellow was Kevin Erickson, and Don Mackey was his brother-in-law, now in serious trouble below. As Erickson aimed his camera, everything below him seemed to explode. “Through the viewfinder, I saw them beginning to run, with fire everywhere behind them,” Erickson said. “As I took the picture, Brad grabbed me and turned me around. I took one more look back and saw a wall of fire coming uphill.” Closing in on Haugh and Erickson were smoke jumper James Thrash and the twelve other fire fighters in a ragged line behind him. Though Blanco and others were now screaming, “Run! Run! Run!” on the radio, Thrash chose to stop and deploy the fire shelter he would die in. Eric Hipke ran around him and followed Haugh and Erickson up the hill. The
150 three-hundred-foot-high flames chasing them sounded like a river thundering over a waterfall. **G**

In his book *Young Men and Fire*, Norman Maclean writes that dying in a forest fire is actually like experiencing three deaths: first the failure of your legs as you run, then the scorching of your lungs, finally the burning of your body. That, roughly, is what happens to wood when it burns. Water is driven out by the heat; then gases are superheated inside the wood and ignited; finally, the cellulose is consumed. In the end nothing is left but carbon.

This process is usually a slow one, and fires that burn more than a few acres per hour are rare. The South Canyon fire, for example, only burned fifty acres
160 in the first three days. So why did it suddenly rip through two thousand acres in a couple of hours? Why did one hillside explode in a chain reaction that was fast enough to catch birds in midair?

Fire typically spreads by slowly heating the fuel in front of it—first drying it, then igniting it. Usually, a walking pace will easily keep fire fighters ahead of this process. But sometimes a combination of wind, fuel, and terrain **conspires** to produce a blowup in which the fire explodes out of control. One explanation for why South Canyon blew up—and the one most popular in

G TAKE NOTES

Summarize what happened at about 4:00 P.M. Then add your summary to your timeline—in proper order.

conspire (kən-spīr') v. to plan or plot secretly



A fire fighter observing the South Canyon fire

Glenwood Springs—was that it was just so . . . steep and dry up there and the wind blew so hard that the mountain was swept with flame. That’s plausible; similar conditions in other fires have certainly produced extreme fire behavior. The other explanation turns on a rare phenomenon called superheating.

Normally, radiant heat⁶ drives volatile⁷ gases—called turpines—out of the pinyon and juniper just minutes before they are consumed. But sometimes hot air rises up a steep slope from a blaze and drives turpines out of a whole hillside full of timber. The gases lie heavily along the contours of the slopes, and when the right combination of wind and flame reaches them, they explode. It’s like leaving your gas stove burners on for a few hours and then setting a match to your kitchen.

A mountainside on the verge of combustion is a subtle but not necessarily undetectable thing; there are stories of crews pulling out of a creepy-feeling canyon and then watching it blow up behind them. Turpines have an odor, and that’s possibly why some of the Prineville survivors said that something had “seemed wrong.” The westward-facing hillside had been drying all afternoon in the summer sun. Hot air was sucked up the drainage as if it were

6. **radiant heat:** heat that passes through the air, heating solid objects that in turn heat the surrounding area.

7. **volatile:** explosive.

an open flue. The powerful winds that hit around 4:00 P.M. blew the fire up the drainage at the hottest time of day. And turpines, having baked for hours, could **conceivably** have lit the whole hillside practically at once. **H**

When Storm King blew, Haugh had to run 150 feet straight up a fire line with poor footing. Despite **rigorous** conditioning—he is a runner and
190 a bodybuilder—his heart rate shot through the roof and his adrenal glands dumped enough epinephrine⁸ into his system to kill a house cat. Behind him, sheets of flame were laid flat against the hillside by 50 mph winds. The inferno roared through inherently combustible vegetation that had been desiccated,⁹ first by drought, then by hot-air convection, finally by a small grass fire that flashed through a few days earlier. The moisture content of the fine dead fuels was later estimated to be as low as 2 or 3 percent—absolutely explosive. As Haugh ran, panicked shouts came over the tiny radio clipped to his vest for people to drop their equipment and flee. One brief thought flashed through his mind—“So this is what it’s like to run for your life”—and he didn’t think
200 again until he reached the ridgetop.

Above him, the BLM and upper Prineville crews had abandoned hope of reaching H-1 and scrambled toward H-2. When that route too was blocked, they turned and plunged over the ridge. Due south, one hundred feet below **I** H-1, the eight smoke jumpers who had been ordered out by Don Mackey fifteen minutes earlier were crawling under their foil shelters to wait out the approaching fire storm. At Canyon Creek far below, a crew of fresh smoke jumpers who were preparing to hike in watched in horror as eight little silver squares appeared on the mountainside. Meanwhile, hidden from view by smoke, Mackey, the Prineville nine, and the three smoke jumpers were running
210 a race only one of them, Hipke, would win.

In the end twelve of the dead were found along the lower fire line. Prineville hotshot Scott Blecha had also run past Thrash but lost his race a hundred feet from the ridgeline. The rest were in two main groups below a tree—the tree, as it came to be known, where Haugh had started his run—a few clumped so close together that their bodies were actually touching. Only smoke jumpers Thrash and Roger Roth had deployed their shelters, but the blistering heat disintegrated the foil. Kathi Beck died alongside Thrash, partly under his shelter. It seemed that in his last agony, Thrash may have tried to pull her in. In addition, Richard Tyler and Robert Browning, two fire fighters deployed
220 earlier to direct helicopter operations, perished just north of H-2, only a few hundred feet from a rocky area that might have saved them. **J**

The Prineville nine’s dash for safety ended after three hundred feet. They were caught just three or four seconds before Haugh himself cleared the ridgetop, and he could hear their screams over his radio. Reconstructing the details of the victims’ agonized last seconds would occupy many hours of professional counseling for the survivors.

8. **epinephrine**: another name for adrenaline, a natural chemical released by the body that speeds up heartbeats, improves breathing, and increases blood flow to muscles during exercise.

9. **desiccated**: thoroughly dried out.

H TAKE NOTES

Based on Junger’s explanation of superheating, what might have been happening for several hours before 4:00 P.M.? Indicate this possible occurrence on your timeline.

conceivably

(kən-sēv’ə-blē) *adv.*
possibly

rigorous (rĭg’ər-əs) *adj.*
strict, uncompromising

I GRAMMAR AND STYLE

Reread lines 201–203. Notice how Junger uses the **adverb clause** “When that route too was blocked” to describe at what point the Prineville crew plunged over the ridge. Adverb clauses help to add important details to writing, telling when or where something happened, for example.

J PATTERNS OF ORGANIZATION

Why do you think Junger chose to present these details in spatial order?

Dying in a fire is often less a process of burning than of asphyxiation.¹⁰ Their suffering was probably intense but short-lived. Pathologists looked for carbon in their lungs and upper airways and found none, which meant the victims weren't breathing when the fire passed over them. Their lungs were filled with fluid, their throats were closed in laryngeal spasms—responses to superheated air—and their blood contained toxic levels of carbon monoxide. This gas, given off during incomplete combustion, displaces oxygen in the blood and kills very quickly. **K**

“They died after a few breaths at most,” said Rob Kurtzman, a pathologist at the Grand Junction Community Hospital, “probably in less than thirty seconds. All the body changes—the charring, the muscle contractions, the bone fractures—happened after they were dead.” **L**

A bout four-thirty Haugh, Erickson, and Hipke staggered onto Interstate 70. Just an hour before, they had enjoyed a well-earned break on the mountain; now fourteen people were dead. But all they knew at that point was that Blanco, the incident commander, was calling out names on the radio and a lot of people weren't answering.

Haugh and Erickson laid Hipke in the shade of a police cruiser and doused him with water to lower his body temperature and prevent him from going into shock. Blanco climbed back up toward the fire to look for more survivors but found none. The eight smoke jumpers who'd deployed their shelters below H-1 emerged, shaken but unhurt. They were saved not by their shelters but by having deployed them on previously burned ground. The fire was still pumping at this point, and Glenwood Springs was now in danger. Flames were racing eastward along the upper ridges, and the BLM command post at nearby Canyon Creek had begun ordering residents to evacuate.

Haugh's BLM crew had survived. The other Prineville Hotshots—the upper placements—made it out as well. They had snaked their way down the east side of the ridge through a hellish maze of spot fires and exploding trees. Two of them had tried to deploy their shelters but were dragged onward by friends. **M**

Word quickly filtered back to BLM officials in Grand Junction that something terrible had happened on Storm King. Mike Mottice, the agency's area manager, had driven past the blowup and arrived at his Glenwood Springs office around 5:00 P.M. Minutes later crews began arriving from the mountain, and Mottice realized for the first time that there were people unaccounted for. “I hoped that the fire shelters would save them,” he said. “But that evening some smoke jumpers confirmed that there were deaths.” . . .

The next morning investigators began to measure things, ponder the dynamics of the mountain, and coax secrets from the dead.

The first question was how fast the fire had moved, and Haugh's estimate—that the last three hundred feet were covered in about twelve seconds—turned out to be close. In the end, the investigators confirmed that the fire had

COMMON CORE L1

K GERUNDS

A **gerund** is a verb form that functions as a noun. Because they are derived from verbs, gerunds are useful in expressing processes and actions. Reread line 227. *Dying* and *burning* are both gerunds. What other gerund appears in lines 228–230?

L NARRATIVE NONFICTION

Reread lines 227–238. Why might Junger have included this medical information in his narrative?

M NARRATIVE NONFICTION

What details indicate that the other Prineville Hotshots also went through a harrowing journey to survive?

10. **asphyxiation**: the medical term for suffocation.



A plane releasing fire retardant on the blaze

covered the quarter-mile slope in about two minutes, hitting its top speed of
270 18 mph in the dried-out Gambel oak.

The next question was why it had done that. Fire behavior is determined by an incredibly complicated interaction of fuel, terrain, and wind, and there are mathematical models describing the interaction. (The models are programmed into hand-held calculators carried by most incident commanders these days.) The deadly hillside faced west at a 33 to 50 percent slope, and the vegetation on it possessed burning characteristics described in a formula called Fuel Model Number Four. The moisture content of the small dead fuels on Storm King Mountain was around 3 percent. And the live Gambel oak (which had only been partly burned earlier) was several times drier than normal. In a light
280 wind, according to this model, those conditions would produce twenty-three-foot flames spreading at a maximum of seven hundred feet an hour.

That's a manageable fire, or at least one that can be outrun, but an increase in wind speed can change the situation dramatically. At 7:20 p.m. on Tuesday (less than twenty-four hours before the blowup), the National Weather Service issued a "Red Flag" fire warning for the area around Glenwood Springs. Dry thunderstorms were expected the following morning, followed by southwest winds gusting up to 30 mph. A cold front would come through sometime that afternoon, swinging the winds to the northwest.

COMMON CORE RI.4

Language Coach

Multiple Meanings

Some words have specialized meanings. A *model* is usually a small version of a larger object. What does it mean in line 273? (Line 276 gives a clue.) In line 287, *front* means "boundary between different air masses." What does *front* usually mean?



Fire fighter Eric Hipke revisits Storm King Mountain in 2004.

Gusts of 35 mph, plugged into Fuel Model Number Four, produce sixty-
290 four-foot flames racing up the mountain at up to fifteen feet per second. In the
superdry Gambel oak, the rate of spread would have been almost twice that—
much faster than any human can run. The lessons of the Battlement Mesa fire
(detailed in the *Situation #8* video) had not been learned: A small fire on steep
ground covered with extremely dry vegetation had once more exploded in a
mathematically predictable way—again, with tragic results. . . . **N**

“I know in my heart,” said Haugh, “that the twelve persons who died
in that part of the fire were unaware of what was happening.” By the time
the Prineville nine and the three smoke jumpers with them saw the horror
coming—by the time great sheets of flame hit the dry Gambel oak and frantic
300 voices over the radio screamed at them to run—they had only twenty seconds
to live. They must have died in a state of bewilderment almost as great as
their fear. **N**

N PATTERNS OF ORGANIZATION

Reread lines 271–295.

What pattern of organization does Junger use to explain fire behavior? What type of graphic organizer would you use to record details from this passage?

Comprehension

1. **Recall** How were Brad Haugh and the other two men with him able to escape the fire?
2. **Recall** How did the fire originally begin on July 2?
3. **Recall** What effect did the cold front have on the fire?
4. **Clarify** Why did so many fire fighters die?

COMMON CORE

RI 3 Analyze how the author unfolds and develops a series of events, the order in which they occur, and the connections drawn between events. **RI 5** Analyze in detail how an author's ideas or claims are developed.

Text Analysis

5. **Examine Notes** Using the timeline you created, explain what happened on Storm King Mountain. How long had the fire burned before the first crew arrived? When did the situation on the mountain become a disaster?
6. **Interpret Information** Junger has been praised for delivering a lot of technical information while telling a good story. What did you learn from the selection about wildfires and how to fight them?
7. **Analyze Cause and Effect** Junger proposes that a phenomenon called superheating could have caused the blowup. Reread the passage about superheating (lines 171–187). Then use a cause-and-effect chart to show how it occurs.


```

graph TD
    A[Hot air rises up a slope.] --> B[ ]
    B --> C[ ]
    style A fill:#add8e6,stroke:#333,stroke-width:1px
    style B fill:#ffcc00,stroke:#333,stroke-width:1px
    style C fill:#ffcc00,stroke:#333,stroke-width:1px
            
```
8. **Evaluate Narrative Nonfiction** Where is Junger strongest as a storyteller? Cite passages employing **suspense**, **foreshadowing**, vivid **characterization**, or other elements you found particularly effective.
9. **Apply Ideas** Junger believes that people with dangerous jobs are more heroic than people who participate in extreme sports. Do you think the fire fighters portrayed in “Blowup” are heroic? Explain why or why not.

What can we learn from **DISASTER**?

What lesson have you learned from witnessing or reading about a disaster?

Vocabulary in Context

▲ VOCABULARY PRACTICE

Decide if each statement is true or false.

1. To **deflect** criticism means to attract it all the time.
2. A **contingent** is often a smaller group of people.
3. To **conspire** with people is to act together with them.
4. If it can **conceivably** rain today, this means there is no chance of it happening.
5. A **rigorous** course of study is easy and will teach very little.

ACADEMIC VOCABULARY IN WRITING

• author • document • goal • issue • vision

Write three questions you might ask the **author** in an interview. Consider **issues** that relate to the Storm King disaster or to writing nonfiction. Use at least one Academic Vocabulary word in your response.

VOCABULARY STRATEGY: ANALOGIES

Analogies express relationships between pairs of words. Some common relationships are described in the chart. By analyzing the relationship between words in analogies, you can determine the meaning of words you're unfamiliar with.

Type	Relationship
Part to a whole	is a part of
Antonym	means the opposite of
Cause and effect	results in or leads to
Grammar	is grammatically related to

PRACTICE Complete each analogy by choosing the appropriate word from the Word List. Identify the kind of relationship on which the analogy is based.

1. interruption : distract :: obstacle : _____
2. indignation : indignant :: rigor : _____
3. slightly : greatly :: impossibly : _____
4. school : class :: military : _____

WORD LIST

conceivably
conspire
contingent
deflect
rigorous



L.5 Demonstrate understanding of word relationships.

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Language

◆ GRAMMAR AND STYLE: Add Descriptive Details

Review the **Grammar and Style** note on page 565. An **adverb clause** tells *where, why, how, when, or to what degree* something was done. It is typically introduced by a subordinating conjunction such as *after, as, because, since, until, when,* and *where*. In the following excerpts, notice how Junger uses adverb clauses to explain when certain events occurred. Also pay attention to the structure of these sentences; notice where the adverb clauses are placed.

As they started down again, the fire was spreading behind them at a thousand acres an hour, oak, pinyon, and juniper spontaneously combusting in the heat. (lines 33–35)

All the body changes—the charring, the muscle contractions, the bone fractures—happened after they were dead. (lines 237–238)

Notice how the revisions in blue enhance the description in this first draft. Revise your responses to the prompt by including adverb clauses, making sure to set them off with a comma when they come before independent clauses.

STUDENT MODEL

People who fight wildfires need to be very strong. *As they walk up and down steep slopes,* They must haul their *Since chain saws can weigh 10 to 12 pounds and two gallons of water can weigh 17 pounds,* food, water, and equipment, such as chain saws and fire shelters. *This is a* difficult task.

READING-WRITING CONNECTION



Deepen your understanding of “Blowup: What Went Wrong at Storm King Mountain” by responding to this prompt. Then use the **revising tip** to improve your writing.

WRITING PROMPT

Extended Constructed Response: Identification

What is the most important lesson to be learned from the **disaster** on Storm King Mountain? Write **three to five paragraphs** discussing mistakes made and offering one or more proposals for the future.

REVISING TIP

Review your response. Did you use adverb clauses to add descriptive details? If not, revise your draft. Pay attention to the structure of the sentences you create.

COMMON CORE

L 1b Use various types of clauses to convey specific meanings and add variety and interest to writing. **W 2** Write explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective analysis of content.

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