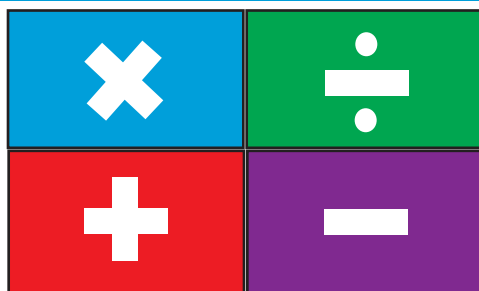


Math TODAY™ Challenge Student Edition

USA TODAY

NO. 1 IN THE USA



Wildfires nearly snuffed

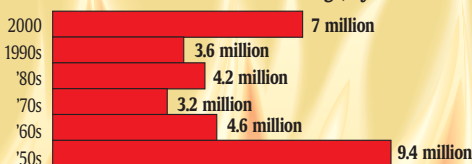
Wildfires nearly snuffed

Only four large wildfires (more than 100 acres) were burning in the USA Monday, down from a September peak of 86 active fires. Active fires in California, Nevada and two in Minnesota were 50%-100% contained. Low humidity and high winds are a concern in California and Florida, where some small fires have gotten a start.

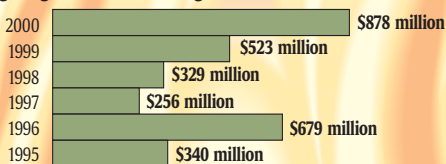
January-October 2000 wildfire season

A strong La Niña weather pattern, dry ground fuels from previous dry seasons, and persistent hot, dry weather, led to one of the most severe wildfire seasons in U.S. history. Comparing the 2000 season (as of Oct. 21) with previous ones:

Acres burned in 2000 season and annual average, by decade



Firefighting costs for federal agencies¹



States where most acreage burned in 2000

| | Fires | Acres burned | Portion of state's land burned |
|---------|-------|--------------|--------------------------------|
| Idaho | 1,598 | 1,282,862 | 2.4% |
| Montana | 2,366 | 947,819 | 1.0% |
| Alaska | 351 | 751,233 | 0.2% |

1 - U.S. Forest Service, National Park Service, Bureau of Land Management, Bureau of Indian Affairs, Fish and Wildlife Service

Source: National Interagency Fire Center

By Dave Merrill and Bob Laird, USA TODAY

Focus Questions:

- Suppose a fire approximately the size of Walker, about 16,000 acres, was burning in the shape of a rectangle. What dimensions (measured in miles) for the rectangle produce the smallest perimeter? What is the smallest perimeter?
- Suppose the shape of the wildfire was a circle. To the nearest mile, what are the radius and circumference of this wildfire?
- Firefighters may control a fire by ensuring that the area just outside the perimeter of the fire is kept from burning. Which geometric shape would be the easiest to control? Why?
- The USA TODAY Infograph "Wildfires nearly snuffed" shows the costs for federal agencies to fight fires from 1995 through 2000. What are the mean and median values for this time period?
- What was the cost per acre to fight wildfires in the January-October 2000 season?

Activity Overview:

Every summer, wildfires spread when areas of the United States become hot and dry. We often hear reports about the number of acres that are burning and see footage from the regions. How large is the area that is burning? What are some possible perimeters for the fires? To help understand these questions, you will investigate the relationship between area and perimeter for rectangles and circles. Additionally, you will explore the cost to fight wildfires. Before you start this activity, read the USA TODAY article "Fires rage in the West at a mid-August pace" and then read the USA TODAY Infograph "Wildfires nearly snuffed."

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Wildfires nearly snuffed



Fires rage in the West at a mid-August pace

NEWS SECTION - WEDNESDAY - JUNE 19, 2002 - PAGE 3A

By Tom Kenworthy
USA TODAY

DENVER — With major fires burning in seven Western states, officials say there is little good news on the horizon as the West heads into the height of the summer fire season.

"The feeling here is what you expect in mid-August," said Don Smurthwaite, a spokesman for the National Interagency Fire Center in Boise. "Probably the only place that looks relatively safe is the Pacific Northwest west of the Cascades. Every other place is at some degree of risk."

Hit hard are Colorado, the Southwest and Southern California. Fire center meteorologist Rick Achoa said the Southeast and mid-Atlantic are also becoming a major concern because of a lack of rain.

With much of the West under a severe drought, the number of acres burned nationwide this year far exceeds the 10-year average for this point in the season.

More than 1.5 million acres have burned this season. The average over the past decade is 862,000 acres.

Even in the devastating fire season of 2000, in which 8.4 million acres were destroyed, the number of acres burned by mid-June of that year was 1.2 million.

In California, three major fires were burning. One closed Interstate 15, the main travel route between Las Vegas and Southern California.

The National Interagency Fire Center grounded air tanker planes similar to one

that crashed Monday in Northern California. Three people died in the crash.

Video footage of the crash showed the plane's wings shearing off and flames erupting as the fuselage spun out of control. Fire officials said they had no idea what happened.

On the front lines of the Colorado fire — the biggest in state history — the so-called Hayman fire southwest of Denver flared up Tuesday. The fire made a run to the southeast, its flames fed by 90-degree temperatures, low humidity and strong winds.

Twenty-five homes have burned in mountainous areas where the fire has blackened 113,000 acres since June 8. More than 6,000 people have had to abandon their homes.

A U.S. Forest Service worker has admitted she started the fire by accident when she burned a letter in a campground fire ring despite a ban on outdoor fires. Fire prevention worker Terry Barton said she left the ring for a short time and returned to find her fire had spread to the trees.

Barton was being held in custody and is scheduled to appear in court Thursday for a bail hearing. She could face 20 years in prison if convicted.

Meanwhile, sheriff's deputies in three Colorado counties south of Denver warned people to be ready to leave. They said they may order mandatory evacuations if erratic, high winds blew up late Tuesday.

The fire was within 6 miles of Woodland Park, a town of 7,500 people 20 miles northwest of Colorado Springs. It jumped a highway nearby.

High winds kept another large fire burning in the southwest corner of the state. The Missionary Ridge fire northeast of Durango, Colo., in the San Juan National Forest, has burned about 38,000 acres. On Tuesday, it burned nine houses. People left their homes to get out of its way.

The Hayman fire is 30 miles from metropolitan Denver. Residents there didn't need to watch the morning news to be reminded what was near. It looked like the bad old days when a disgusting blanket of smog known as the "brown cloud" would envelop the city.

A thick plume of acrid smoke crept down the Platte River Valley. It obscured the city's skyline, wrinkling noses and discouraging joggers.

Southwesterly winds began to clear the air by late morning. While that was good news for Denver, it meant tough conditions for the 2,300 firefighters trying to head off the fire. About half of the fire is now contained within fire lines, the swaths of dirt scraped ahead of the fire to cut it off from its fuel of underbrush and trees.

"It's not looking good right now," said Joe Colwell, a fire information officer. "We'll just have to see how bad it gets."

Wildfires nearly snuffed

Procedure:

Activity 1

Suppose a fire approximately the size of Walker, about 16,000 acres, was burning in the shape of a rectangle. What dimensions for the rectangle produce the smallest perimeter? What is the smallest perimeter?

Step 1:

Use the ScienceTools application to convert 16,000 acres to square miles.
 16,000 acres = _____ square miles

Step 2:

Start the CellSheet™ application and open a blank spreadsheet. Enter the following spreadsheet headings in cells A1:C1.
 WIDTH -width of rectangle
 LENGTH -length of rectangle
 PERIMETER -perimeter of rectangle

Step 3:

Use the capabilities of the spreadsheet (formulas, copy, paste) to enter the values (whole numbers only) for the possible widths using the square miles from Step 1, possible lengths, and the resulting perimeters for a rectangle.

Step 4:

Create a scatter chart of the data using the WIDTH column for the XRange and the PERIMETER column for the YRange.

Step 5:

Trace the scatter chart and determine what dimensions will produce the smallest perimeter.

WIDTH _____ LENGTH _____

What is the smallest perimeter? _____

Step 6:

To exit the application select Menu (press GRAPH) and select Quit CellSheet.

Activity 2

Suppose the shape of the wildfire was a circle. To the nearest mile, what are the radius and circumference of this wildfire?

Make the calculations on the Home Screen for the radius and circumference of a wildfire in the shape of a circle with the same area (square miles) as the rectangle from Activity 1.

Radius _____ Circumference _____

Data Source:

National Interagency Fire Center

Materials:

- TI-83 Plus family or TI-84 Plus family
- CellSheet™ Application
- ScienceTools

Additional Information:

- National Interagency Fire Center

www.nifc.gov

Wildfires nearly snuffed

Activity 3

Firefighters may control a fire by ensuring that the area just outside the perimeter of the fire is kept from burning. Which geometric shape would be the easiest to control? Why?

Activity 4

The USA TODAY Infograph "Wildfires nearly snuffed" shows the costs for federal agencies to fight fires from 1995 through 2000. What are the mean and median values for this time period?

Step 1:

Look at the USA TODAY Infograph "Wildfires nearly snuffed" and complete the chart below.

Firefighting costs for federal agencies

| Year | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|----------------|------|------|------|------|------|------|
| \$ in millions | | | | | | |

Step 2:

Enter the costs for this time period in L1 and use the handheld to determine the mean and median values.

Mean= _____

Median= _____

Activity 5

What was the cost per acre to fight wildfires in the January-October 2000 season?

Step 1:

Use the data from the USA TODAY Infograph "Wildfires nearly snuffed" to find the cost per acre.

Cost per acre _____

Step 2:

Use this cost per acre and determine the amount spent in Idaho during the January-October 2000 wildfire season.

Idaho's expense _____

Student Notes: