



The Story Behind Wildfires

Students will be captivated by this month's sizzling issue of MUSE. Brave humans, advanced firefighting technologies, and animal conservation heroes are among the "hot topics" studied in this publication. Learn why Smokey the Bear's motto, "Only YOU can prevent forest fires," is an important message for us all.

CONVERSATION QUESTION

How can we manage the risk of wildfires?

TEACHING OBJECTIVES

- Students will learn why the risk of wildfires continues to grow.
- Students will learn how animals can be helpful in preventing the spread of wildfires.
- Students will learn how technology is having a major impact on firefighting efforts.
- Students will examine the cause-and-effect relationship as it pertains to the growth of wildfires.
- Students will classify information regarding specific animal behaviors.
- Students will study the processes presented in a science-based text.
- Students will create fractional equivalents using mathematical information from the article.
- Students will plot geographical locations on a world map.
- Students will write a properly formatted letter.



In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

SELECTIONS

- **Fire Danger**
Expository Nonfiction, ~850L
- **Animal Firefighters to the Rescue**
Expository Nonfiction, ~750L
- **Bots vs Blazes**
Expository Nonfiction, ~1050L

Fire Danger

pp. 10–11, Expository Nonfiction

Wildfires are ravaging our nation at an alarming rate. This article will inform readers about the various causes and effects of these devastating events, as well as detail possible solutions.



RESOURCES

- Too Hot to Handle

OBJECTIVES

- Students will learn why the risk of wildfires continues to grow.
- Students will examine the cause-and-effect relationship as it pertains to the growth of wildfires.
- Students will create fractional equivalents using mathematical information from the article.

KEY VOCABULARY

- **devastated** (p. 11) destroyed, left in ruins
- **invasive** (p. 10) tending to spread abundantly and harmfully
- **resolve** (p. 11) to find a solution to, rectify

ENGAGE

Conversation Question: How can we manage the risk of wildfires?

Show a forest fire prevention clip featuring Smokey the Bear. Explain why the slogan, “Only YOU can prevent forest fires,” chose to put the responsibility on citizens to be more vigilant about their potential fire-risk behaviors. Arrange students in small groups to create their own slogan and a more modern mascot. Share and display finished posters.

INTRODUCE VOCABULARY

Review the key vocabulary with the class. Guide students to notice that each word belongs in a different part of the alphabet. (Beginning: A–H, Middle: I–Q, End: R–Z) Have them write these headings at the top of their paper and put each word in the correct category. As a post-reading activity, have students add other fire safety words from the article to their list in the correct columns.

READ & DISCUSS

Reinforce understanding of the growing risk of wildfires by using the following prompts to direct discussion.

- What three things do fires need to grow? Draw the “fire triangle.”
- How do invasive species encourage fires?
- Explain the cycle of climate change and wildfires.
- Respond to the last sentence of the article that asks, “What other ways can you think of to reduce fire danger?”

CONCEPT/SKILL FOCUS: Cause and Effect

INSTRUCT: Lead the students in a discussion that guides them to recognize the cause-and-effect relationships that are studied in this article. Emphasize the fact that it is usually a combination of circumstances that lead to a devastating wildfire. Introduce the graphic organizer and tell students that they will be rereading the article and highlighting pertinent information to record on the chart. Remind them to list specific details. Encourage peer assistance and dialogue.

ASSESS: Converse with students as they are working on the graphic organizer, *Too Hot to Handle*. Collect and review the worksheets to evaluate individual understanding of the cause-and-effect relationship.

EXTEND

Mathematics The article states that humans cause approximately eight out of every ten wildfires. Have students represent this number in fractional form (8/10) and create ten equivalent fractions. At the bottom of the page, have them list *how* humans unintentionally are responsible for this large majority of wildfires.

Too Hot to Handle

Use information from the article, "Fire Danger," to record how climate change and crowded fire zones are causing wildfires.

Causes	Effects
Climate Change	
Crowded Fire Zones	

What is a prescribed burn? Explain the pros and cons below using details from the text.

Animal Firefighters to the Rescue

pp. 26–28, Expository Nonfiction

Students will learn how some of their favorite animals can be true conservation heroes. Look beyond the sheep's wool and the goat's milk to discover how the natural behaviors of these animals, and many others, are ultimately helping to save our planet from the ravages of fire.



RESOURCES

- Furry Firefighters

OBJECTIVES

- Students will learn how animals can be helpful in preventing the spread of wildfires.
- Students will classify information regarding specific animal behaviors.
- Students will plot geographical locations on a world map.

KEY VOCABULARY

- **duff** (p. 27) the partly decayed organic matter on the forest floor
- **ember** (p. 27) a glowing fragment from a fire
- **undergrowth** (p. 27) low growth on the floor of the forest

ENGAGE

Conversation Question: How can we manage the risk of wildfires?

Restate to the class that this month's *Muse* focuses on wildfires. Tell students that in the first paragraph of the article they are preparing to read, it states that wildfires race through a forest at a rate of approximately 14 miles per hour. Have students calculate how many miles a fire can "travel" in the following time periods: 1, 3, 5, and 7 days. (336 miles, 1,005 miles, 1,680 miles, and 2,352 miles)

INTRODUCE VOCABULARY

Review the key vocabulary with the class. Guide students to notice that they are all nouns with a different number of syllables. Have students divide a piece of paper into three columns with the following headings: One-syllable nouns/Two-syllable nouns/Three-syllable nouns. Instruct the class to properly partition each key term and place it in the correct column. As a post-reading activity, have the students search the article for other fire-related nouns that they can add to each column.

READ & DISCUSS

Read the article aloud with the class. Have students reread the article in small groups and answer the questions below. Discuss responses.

- Explain how an entire forest can catch fire from one burning match.
- How much land is cleared by wildfires in the U.S. annually?
- Why are experts turning to animals in an effort to prevent wildfires?
- What are the benefits of using animals rather than controlled burning techniques?

CONCEPT/SKILL FOCUS: Classifying Information

INSTRUCT: Review the processes involving animals that fire experts are beginning to utilize to prevent the spread of wildfires. Present the *Furry Firefighters* graphic organizer and tell the class that they will be using information from the article to classify the fire-prevention behaviors of various animals, as well as how they provide different benefits to our conservation and prevention efforts.

ASSESS: Collect the graphic organizer to determine if students were able to accurately record and classify information. Evaluate understanding by reviewing the accuracy and thoroughness of their work.

EXTEND

Social Studies Have students use their graphic organizer, as well as the text, to alphabetically list all of the geographical locations mentioned in the article. They should classify each place as a state, country, or continent. Provide a blank world map and instruct students to plot each location.

Furry Firefighters

Refer to the article, "Animal Firefighters to the Rescue," to study how each animal is beneficial to fire prevention efforts. Record detailed answers on the chart.

Animal	Where? (location)	How? (process)
goats/sheep		
elephants/rhinos		
beavers		

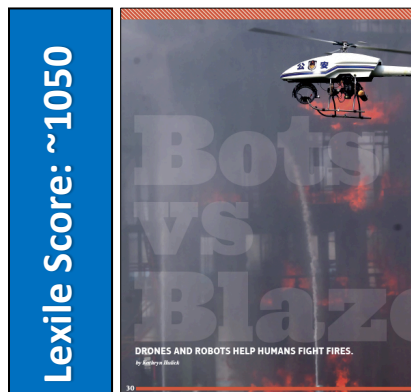
Use the back of the paper to brainstorm ways that other animals could be helpful in our conservation efforts.

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Bots vs Blazes

pp. 30–34, Expository Nonfiction

Humans do not stand alone in their efforts to prevent and extinguish fires. Students will learn how having an “eye in the sky” is critical in minimizing fire devastation and loss of life.



RESOURCES

- Bots Above Blazes

OBJECTIVES

- Students will learn how technology is having a major impact on firefighting efforts.
- Students will study the processes presented in a science-based text.
- Students will write a properly formatted letter.

KEY VOCABULARY

- **arsenals** (p. 34) array of resources available for a certain purpose
- **ignites** (p. 31) catches fire or causes to catch fire
- **thermal** (p. 33) relating to heat
- **visibility** (p. 31) the state of being able to see

ENGAGE

Conversation Question: How can we manage the risk of wildfires?

Distribute the article and review with students how invoking prior knowledge is helpful when reading an informational text. Read aloud the title and subtitles with the class and have the students study the graphics. Predict the content of the article. Revisit predictions when the reading is completed.

INTRODUCE VOCABULARY

Post and review the key vocabulary terms and definitions. Instruct the students to highlight the words as they appear in the text. As a post-reading activity, have them write a summary of the article using these terms.

READ & DISCUSS

Pose the following questions to the students to facilitate meaningful discussion following the reading of the article.

- How can drones serve as an early warning system for wildfires?
- How do drones make recovery from a fire’s destruction a little easier?
- What technology is currently helping firefighting efforts? What future technology is expected to help even more?
- Why can’t robots/drones ever fully replace humans in the efforts to manage disasters?

CONCEPT/SKILL FOCUS: Studying Processes

INSTRUCT: Guide students to articulate that the main idea of this article is to explain the processes by which technology is assisting firefighting efforts. Distribute the graphic organizer, *Bots Above Blazes*, and tell students that they will be using information from the article to explain how different forms of technology are strengthening the abilities of firefighters to reduce the amount of land and lives that are lost from a blaze.

ASSESS: Circulate and discuss the article’s content with students. Collect and examine graphic organizers to further evaluate individual understanding of the studied process.

EXTEND

Language Arts Have students locate your local fire department and research the resources that they currently have available for fighting fires. Instruct students to write a properly formatted letter thanking them for their service, asking relevant questions and possibly inviting them to do a presentation in your class. Encourage peer editing and when completed, mail the letters.

Bots Above Blazes

Use information from the article, "Bots vs Blazes," to describe the development of the firefighting processes listed below.

How did Carl Pennypacker transition from studying space to developing FUEGO?	How can a combination of drones and satellites save lives?

How can drones assist during other emergencies?
