

Teaching Fifth-Grade **Nonfiction Text Features** Using *Smoke Screens and Gas Masks: Chemistry Goes to War* from the **STEM on the Battlefield Series**

Features that help students understand how an informational text is organized:

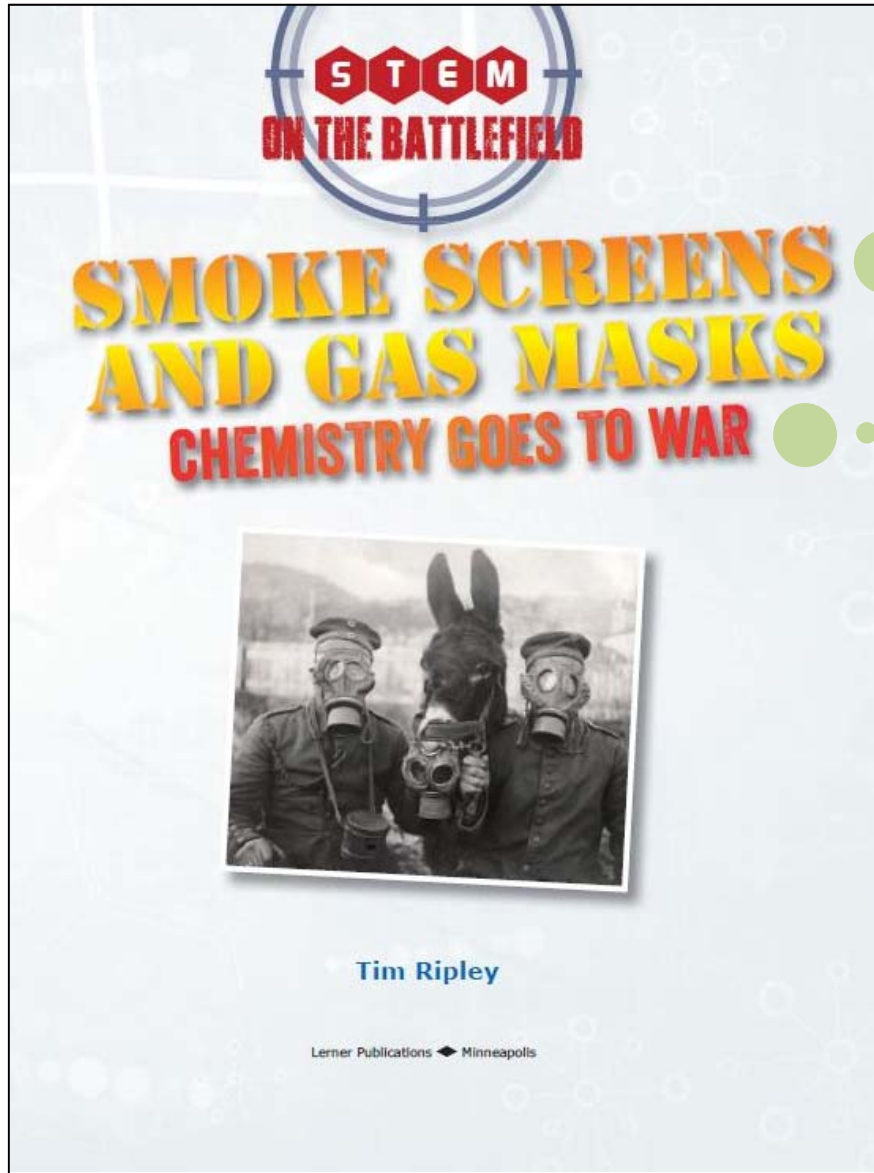
FEATURE	PURPOSE
Title page	Confirms title, author’s name, and publisher
Contents Page	Identifies the topics to be presented and their order
Chapter name, heading, or subheading	Helps students identify main topics on a quick pass through the text
Glossary	Defines new and important words
Further reading and websites	Helps students expand their knowledge of the topic by listing other informational texts in print or on the Internet
Index	Lists the main ideas in the text, with page numbers to help students find them

Visual aids that help students understand informational texts:

VISUAL AID	PURPOSE
Photo, drawing, or illustration	Shows how something in the text looked or might have looked
Diagram	Gives a more detailed view of a complex topic
Map	Puts the places in the informational text in the context of space and time

Features that point out important or additional information:

FEATURE	PURPOSE
Copyright page	Tells students how current the information in a book is
Bold print	Tells students a word is new and important; sometimes a glossary term
Italic Print	Tells students the word is supposed to stand out. It may be for emphasis or because it is a book name, newspaper, movie title, foreign word, or the directional for a photo or illustration.
Caption	Points out what’s in a photo, a drawing, or an illustration and relates it to the informational text; often gives more information
Label	Identifies important points of interest in a diagram or photograph
Sidebar	Boxed or other highlighted bits of information that relate but are not the same as the main informational text; likely not a main idea



TITLE

SUBTITLE

TITLE PAGE: This page tells you the title, author, and publisher of a book.

COPYRIGHT YEAR

COPYRIGHT PAGE:

This page tells you the year the book was published. This may be important for report writing when you need up-to-date information. On this page, you can also find the address of the publisher.

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Lerner Publications Company
A division of Lerner Publishing Group, Inc.
241 First Avenue North
Minneapolis, MN 55401 USA

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Main body text set in Verdana Regular 11/16.5.
Typeface provided by Microsoft.

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Library of Congress Cataloging-in-Publication Data

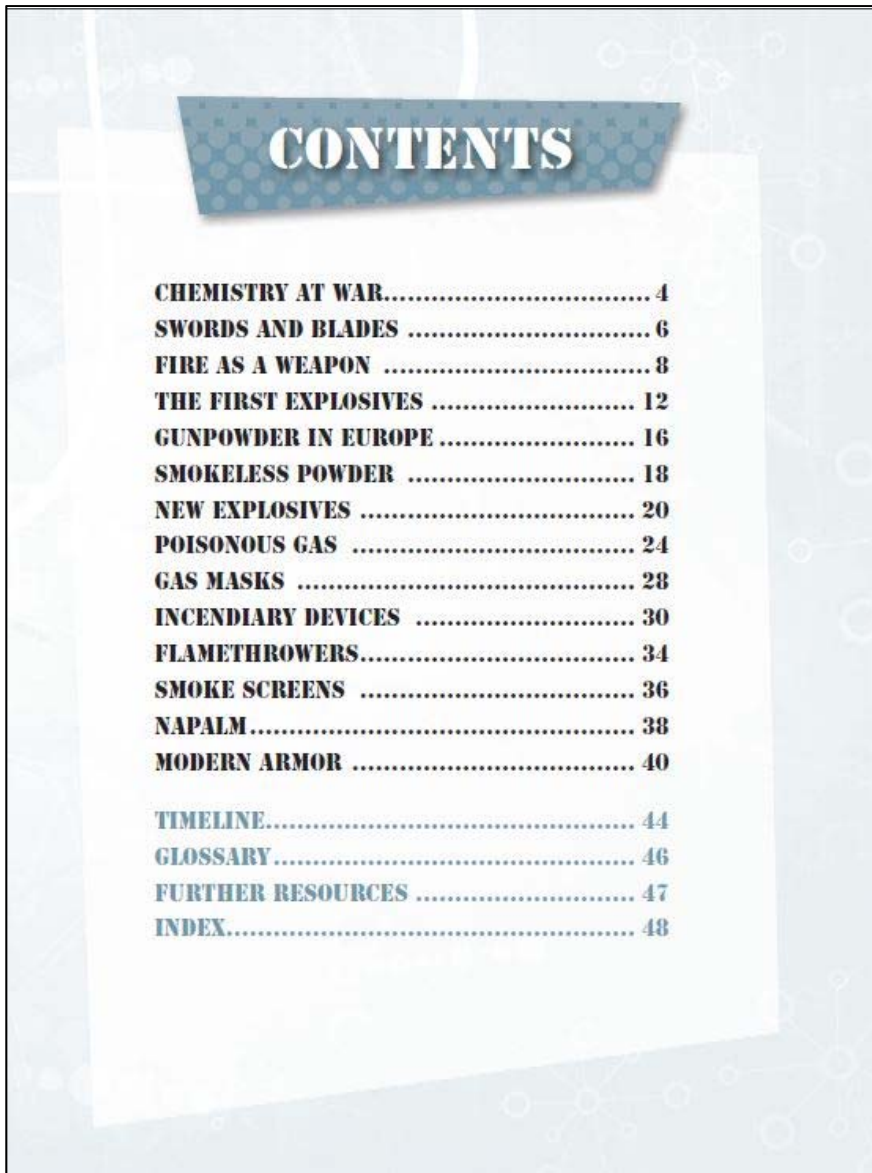
Names: Ripley, Tim, author.
Title: Smoke screens and gas masks : chemistry goes to war / Tim Ripley.
Other titles: Chemistry goes to war
Description: Minneapolis : Lerner Publications, [2017] | Series: STEM on the battlefield | Includes index. | Audience: Grades 4–6. | Audience: Ages 9–12.
Identifiers: LCCN 2016055032 (print) | LCCN 2016055325 (ebook) | ISBN 9781512439250 (lb : alk. paper) | ISBN 9781512449532 (eb pdf)
Subjects: LCSH: Military art and science—History—Juvenile literature. | Chemistry—History—Juvenile literature. | Military weapons—History—Juvenile literature.
Classification: LCC U27 .R55 2017 (print) | LCC U27 (ebook) | DDC 355/.07—dc23

LC record available at <https://lccn.loc.gov/2016055032>

Manufactured in the United States of America
1-42138-25411-3/20/2017

CONTENTS PAGE:

This lists the chapters in your book by chapter title and the pages on which they begin. It also lists features, such as the index, that are at the end of the book.



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CHAPTER TITLE: This tells you what topic will be discussed in the chapter. Chapter titles often give you the main ideas of the book.

CAPTION: These words tell you about the picture on the page. A caption is usually close to the picture it describes. Sometimes a caption will tell you if the picture is a photo or a drawing. A caption may also give you additional information that is not in the main text.

CHEMISTRY AT WAR

During World War I (1914–1918), German commanders wanted to capture a French fortress at Verdun, on France's eastern border. On February 21, 1916, German **artillery** opened fire. In just under five hours, 800 big guns fired around one million **shells** at French positions. The French defended the fort for nine more months before the Germans withdrew. Despite its failure, the **bombardment** was one of the biggest ever fired, and it showed the importance of **chemistry** in warfare. Chemists had not only developed explosives for the shells. They had also figured out ways to make millions of shells quickly and relatively safely.

British workers make shells in a factory during World War I.



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PHOTOS:

The photos or pictures in a book show what the words, or text, describe. Looking at photos can help you understand the meaning of the text.

SIDEBARS:

These are short bits of text with their own headers. They are usually boxed and separated from the main text. Sidebars give additional information.



A US Marine fits a bayonet to his weapon. Steel bayonets are still used for hand-to-hand fighting.

This development marked the start of the Iron Age. People soon began to use iron to make weapons.

IRON AND STEEL

Iron made bronze **obsolete**. Bronze weapons could not pierce iron armor. In turn, iron was replaced by steel by around the 300s B.C.E. Steel was even stronger, and lighter, than iron. It also kept its sharp edge for longer.

In the modern era, **infantry** soldiers still attach steel bayonets to their rifles. Bayonets are used as stabbing weapons in close combat.

SCIENCE FILE

Metallurgy and Metals

Bronze is an alloy, a metal made by mixing two or more metals. Bronze is made by mixing copper with tin. Metallurgy is the science of combining metals to make alloys. Early chemists learned to use heat to create new metals. The new alloys were stronger, lighter, and easier to make into weapons than pure metals had been.

FIRE AS A WEAPON

Since prehistoric times, fire has been an important weapon. Early chemists learned to direct fire against targets.

Ancient armies used fire as a destructive weapon. Many early battles were sieges. In a siege, an army surrounded a walled city to force it to surrender. Fire could help burn wooden city walls and create gaps for soldiers to enter the city. Burning **missiles** were also thrown into besieged towns. The missiles set fire to buildings. That terrified people inside the towns.

Wooden defenses are buildings burned easily. Medieval buildings stood close together, so fires spread quickly.



8

HEADINGS AND SUBHEADINGS:

These separate the main text into smaller chunks of information. A heading tells you what the section below is about.

TEXT OR MAIN TEXT: These are the words on a page that describe the main ideas of the book. Main text is usually smaller than chapter titles or headings.

BOLD PRINT:

Words in bold print have thicker letters. They tell you the word or idea is important. They are also usually in a glossary, or a list with meanings, at the end of the book.



GLOSSARY:

This list calls out the important words in a book. The glossary proves the meaning, or definition, of the word. You can find the glossary near the end of the book.

GLOSSARY

airships: long, thin balloons powered by engines

allies: countries that agree to work together for a particular purpose

artillery: large guns such as cannons

bombardment: a continuous attack with bombs or shells

bunkers: reinforced concrete shelters that are often underground

ceramic: made from hardened clay

contaminated: poisoned by contact with a poisonous substance

controversial: describes something that causes disagreement

dispersed: thinned out and disappeared

flammable: easily set on fire

flint: a hard rock that splits into flat sheets

gauze: a thin, transparent fabric

guerrillas: small groups of fighters who use tactics such as ambushes

ignite: to set fire to something

incendiary: intended to start a fire

infantry: soldiers who fight on foot

missiles: weapons that are propelled toward a target

molten: melted

muskets: long-barreled guns that are fired from the shoulder

obsolete: out of date

ore: rocks containing metals

percussion: describes something that is activated by being struck

polymer: an artificial material such as plastic

projectile: a missile fired from a gun

propellant: a substance that propels a rocket or fires a bullet

radar: a system for locating objects by using radio waves

shells: explosive artillery missiles

stalemate: a situation in which neither side in a conflict can win or take any action

surveillance: close observation of the enemy

warhead: the explosive head of a missile or shell

FURTHER RESOURCES

Books

Oxlade, Chris. *Inside Tanks and Heavy Artillery*. Minneapolis: Hungry Tomato, 2018.

Regan, Lisa. *Chemistry Is Explosive*. New York: Gareth Stevens Publishing, 2017.

Samuels, Charlie. *Machines and Weaponry of World War I*. New York: Gareth Stevens Publishing, 2013.

Wood, Alix. *Chemical Weapons*. New York: PowerKids Press, 2016.

Websites

Alfred Nobel
http://www.bbc.co.uk/history/historic_figures/nobel_alfred.shtml

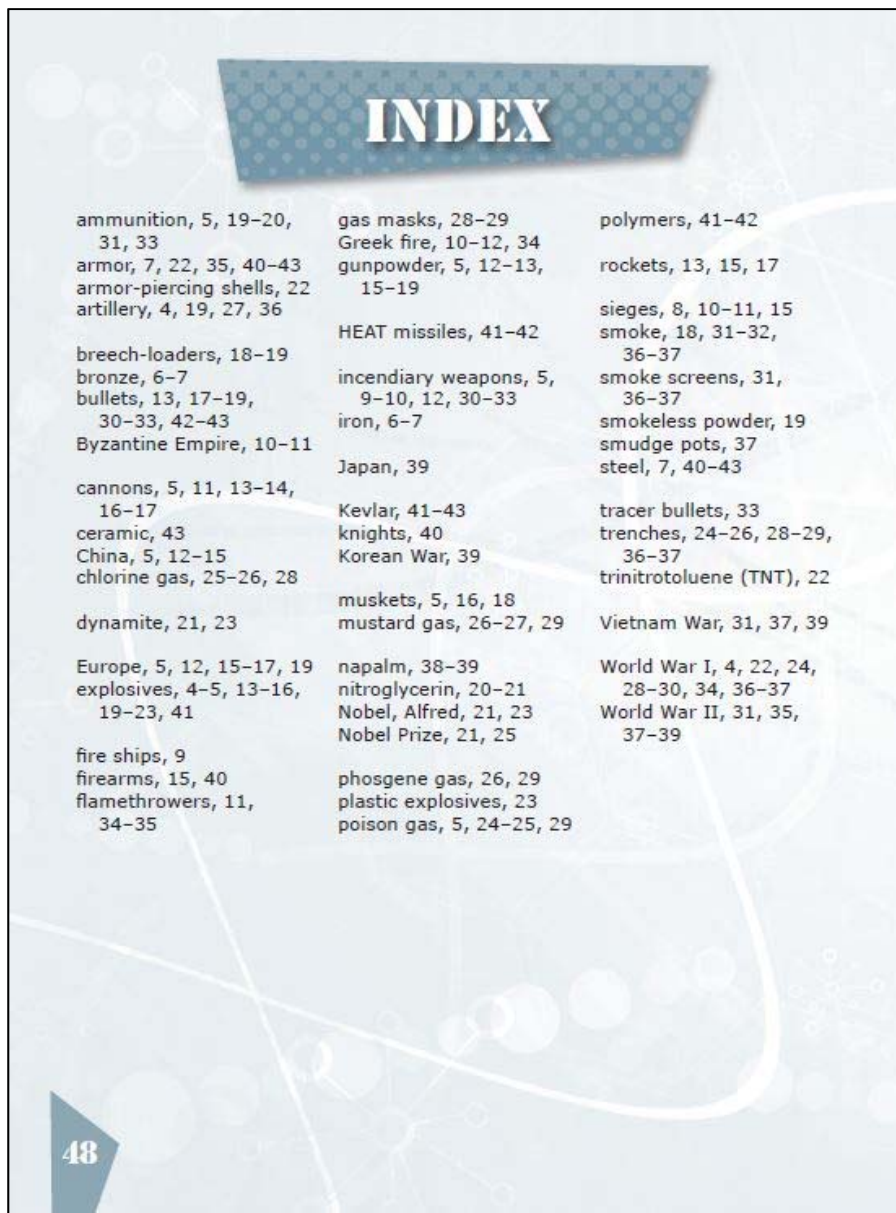
Gunpowder from China
<http://quatr.us/war/gunpowder.htm>

The History of Explosives
<http://inventors.about.com/od/estartinventions/a/explosives.htm>

Stephanie Kwolek
<http://www.women-inventors.com/Stephanie-Kwolek.asp>

When Chemicals became Weapons of War
<http://chemicalweapons.cenmag.org/when-chemicals-became-weapons-of-war/>

FURTHER READING: This list offers suggestions of books and websites on the same subject as the book you just read. You can learn more by looking at books and websites from the list. The list is at the end of your book.



INDEX: This list at the end of the book follows the order of the alphabet. The index helps you find main ideas. The words in the index are followed by page numbers. These numbers tell you where to go in a book to find the main ideas.