

I Wonder Why

RUBBER VS. GLASS

By **Lawrence F. Lowery**

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National Science Teachers Association

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RUBBER

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By **Lawrence F. Lowery**

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17 16 15 14 4 3 2 1

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Library of Congress Cataloging-in-Publication Data

Lowery, Lawrence F., author.
[I like rubber, I like glass]
Rubber vs. glass / Lawrence F. Lowery ; illustrated by Phil Smith.
pages cm -- (I wonder why)
Originally published: New York: Holt, Rinehart and Winston, 1969 under title: I like rubber, I like glass.
Audience: K to 3.
ISBN 978-1-938946-50-9
1. Rubber--Juvenile literature. 2. Glass--Juvenile literature. I. Smith, Phil, 1930- illustrator. II. Title. III. Title: Rubber versus glass.
TS1890.L68 2014
620.1’94--dc23

2014019380

Cataloging-in-Publication Data are also available from the Library of Congress for the e-book.



Introduction

The *I Wonder Why* series is a set of science books created specifically for young learners who are in their first years of school. The content for each book was chosen to be appropriate for youngsters who are beginning to construct knowledge of the world around them. These youngsters ask questions. They want to know about things. They are more curious than they will be when they are a decade older. Research shows that science is students’ favorite subject when they enter school for the first time.

Science is both *what* we know and *how* we come to know it. What we know is the content knowledge that accumulates over time as scientists continue to explore the universe in which we live. How we come to know science is the set of thinking and reasoning processes we use to get answers to the questions and inquiries in which we are engaged.

Scientists learn by observing, comparing, and organizing the objects and ideas they are investigating. Children learn the same way. The thinking processes are among several inquiry behaviors that enable us to find out about our world and how it works. Observing, comparing, and organizing are fundamental to the more advanced thinking processes of relating, experimenting, and inferring.

The five books in this set of the *I Wonder Why* series focus on some content of the physical sciences. The physical sciences consist of studies of the physical properties and interactions of energy and inanimate objects as opposed to the study of the characteristics of living things.

Physics, along with mathematics and chemistry, is one of the fundamental sciences because the other sciences, such as botany and zoology, deal with systems that seem to obey the laws of physics. The physical laws of matter, energy, and the fundamental forces of nature govern the interactions between particles and physical entities such as subatomic particles and planets.

These books introduce the reader to several basic physical science ideas: exploration of the properties of some objects (*Rubber vs. Glass*), interaction with the properties of light and the effect of light on objects (*Light and Color; Dark as a Shadow*), the nature of waves and sound (*Sounds Are High, Sounds Are Low*), and the use of simple machines to accomplish work (*Michael’s Racing Machine*).

The information in these books leads the characters and the reader to discover how opaque objects block light and cast shadows, that different objects have special and useful properties (glass and rubber), that simple mechanical tools reveal some of the laws of physics, and that “nontouchable items” such as light and sound energy also have distinctive properties.

Each book uses a different approach to take the reader through simple scientific information. One book is expository, providing factual information. Several are narratives that allow a story involving properties of objects and laws of physics to unfold. Another uses poetry to engage the characters in hands-on experiences. The combination of different styles of artwork, different literary ways to present information, and directly observable scientific phenomena brings the content to the reader through several instructional avenues.

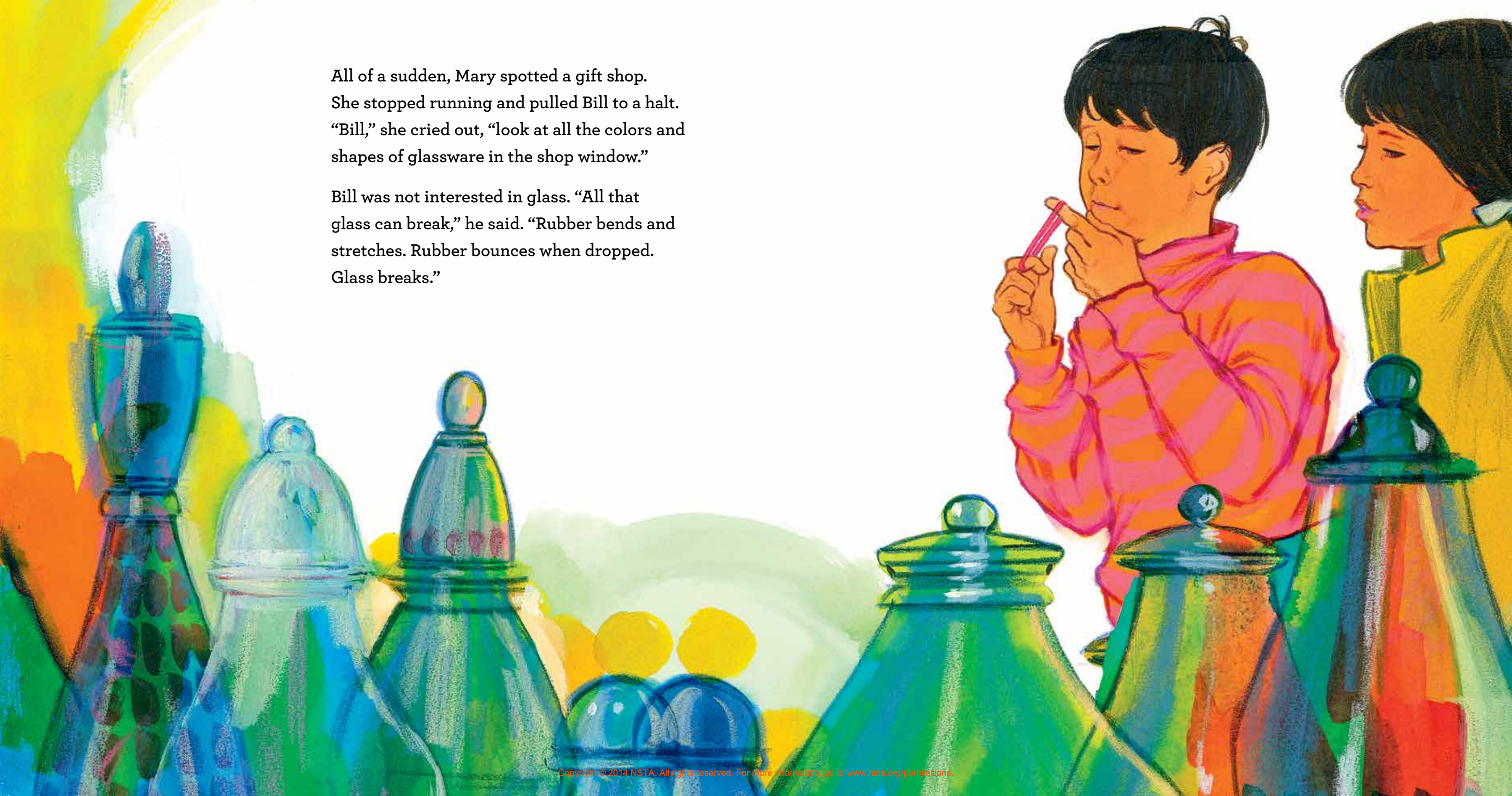
In addition, the content in these books supports the criteria set forth by the *Common Core State Standards*. Unlike didactic presentations of knowledge, the content is woven into each book so that its presence is subtle but powerful.

The science activities in the Parent/Teacher Handbook section in each book enable learners to carry out their own investigations related to the content of the book. The materials needed for these activities are easily obtained, and the activities have been tested with youngsters to be sure they are age appropriate.

After completing a science activity, rereading or referring back to the book and talking about connections with the activity can be a deepening experience that stabilizes the learning as a long-term memory.

All of a sudden, Mary spotted a gift shop.
She stopped running and pulled Bill to a halt.
“Bill,” she cried out, “look at all the colors and
shapes of glassware in the shop window.”

Bill was not interested in glass. “All that
glass can break,” he said. “Rubber bends and
stretches. Rubber bounces when dropped.
Glass breaks.”





“Glass can bounce, too. Just watch,” answered his sister as she pulled a red glass marble out of her pocket and dropped it on the sidewalk. “See, glass bounces.”

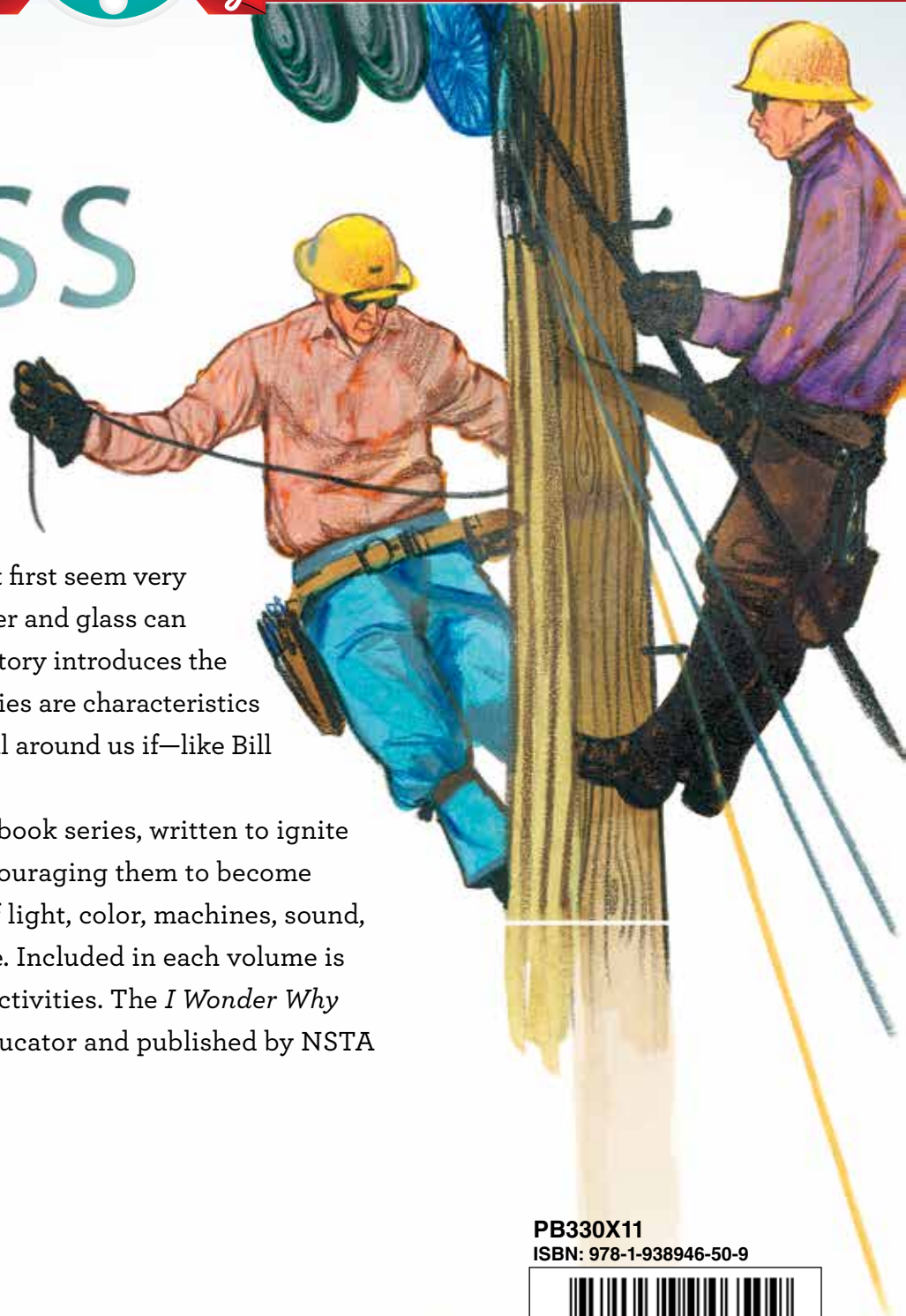
Bill tried to catch the bouncing marble but missed. The marble rolled off the sidewalk and stopped near the wheels of a car parked at the curb.

“All right, all right, glass bounces,” agreed Bill. “But you don’t see any glass tires on that car, do you?”





RUBBER VS. GLASS



A friendly debate leads twins Bill and Mary to compare rubber balls, rafts, and gloves with glass marbles, greenhouses, and jars, objects that at first seem very different. A field trip teaches them that both rubber and glass can bend, bounce, stretch, and even melt. This lively story introduces the concept of properties. As scientists know, properties are characteristics that help us understand the traits of substances all around us if—like Bill and Mary—we observe closely.

Rubber vs. Glass is part of the *I Wonder Why* book series, written to ignite the curiosity of children in grades K–6 while encouraging them to become avid readers. These books explore the marvels of light, color, machines, sound, and other phenomena related to physical science. Included in each volume is a Parent/Teacher Handbook with coordinating activities. The *I Wonder Why* series is written by an award-winning science educator and published by NSTA Kids, a division of NSTA Press.

Grades K–6

Lexile® measure: 620L

NSTA Kids
National Science Teachers Association

PB330X11

ISBN: 978-1-938946-50-9

