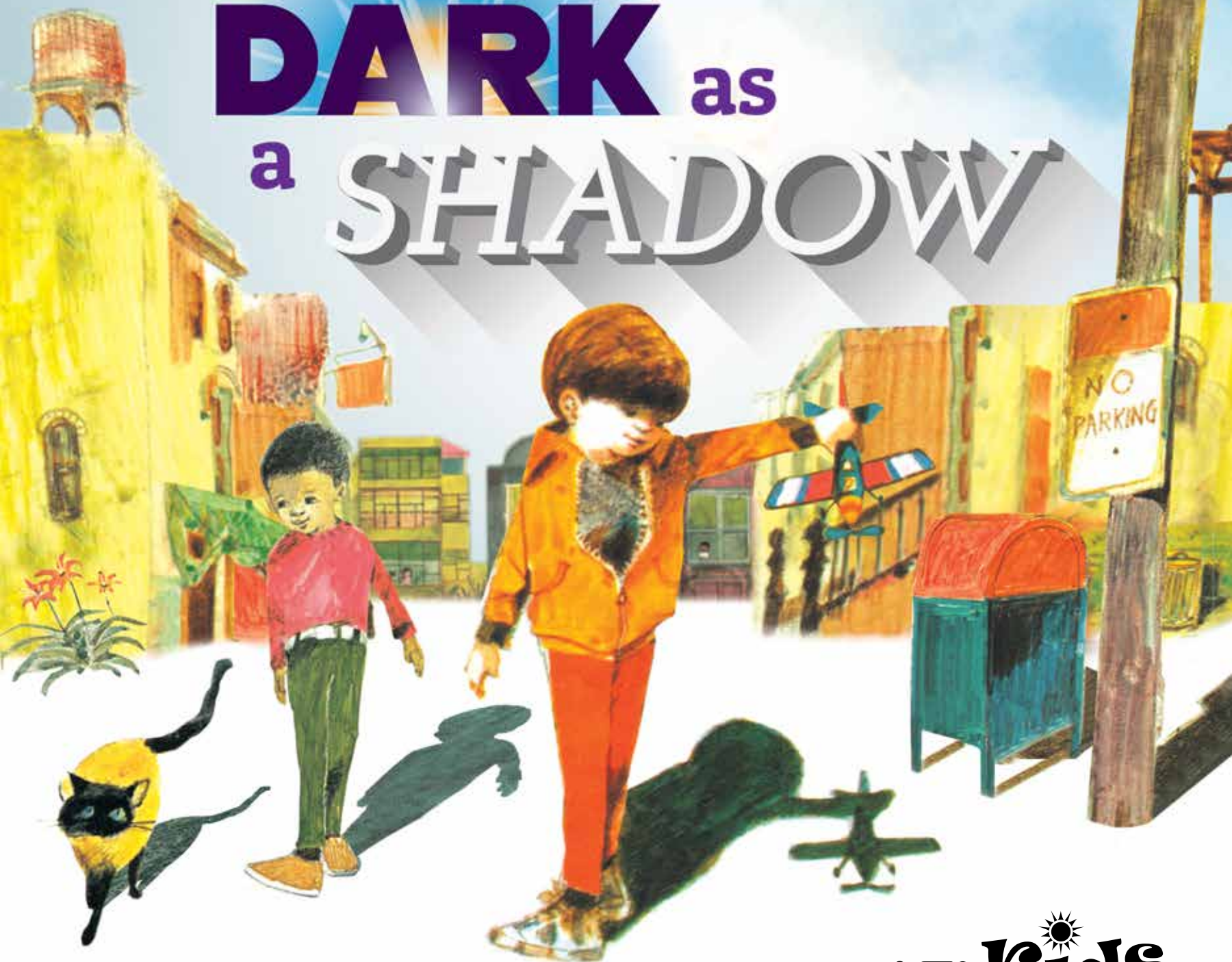




DARK as a SHADOW



By **Lawrence F. Lowery**

NTA Kids
National Science Teachers Association

Copyright © 2014 NSTA. All rights reserved. For more information, go to www.nsta.org/permissions.

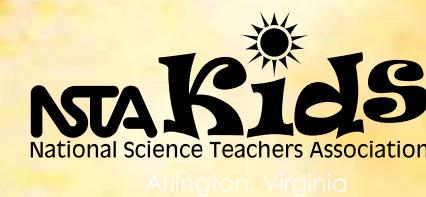
DARK as a **SHADOW**





DARK as a **SHADOW**

By **Lawrence F. Lowery**
Illustrated by **June Goldsborough**





Claire Reinburg, Director
Wendy Rubin, Managing Editor
Andrew Cooke, Senior Editor
Amanda O’Brien, Associate Editor
Amy America, Book Acquisitions Coordinator

ART AND DESIGN
Will Thomas Jr., Director
Joseph Butera, Cover, Interior Design
Original illustrations by June Goldesborough

PRINTING AND PRODUCTION
Catherine Lorrain, Director

NATIONAL SCIENCE TEACHERS ASSOCIATION
David L. Evans, Executive Director
David Beacom, Publisher

1840 Wilson Blvd., Arlington, VA 22201
www.nsta.org/store
For customer service inquiries, please call 800-277-5300.

Copyright © 2014 by the National Science Teachers Association.
All rights reserved. Printed in the United States of America.
17 16 15 14 4 3 2 1

NSTA is committed to publishing material that promotes the best in inquiry-based science education. However, conditions of actual use may vary, and the safety procedures and practices described in this book are intended to serve only as a guide. Additional precautionary measures may be required. NSTA and the authors do not warrant or represent that the procedures and practices in this book meet any safety code or standard of federal, state, or local regulations. NSTA and the authors disclaim any liability for personal injury or damage to property arising out of or relating to the use of this book, including any of the recommendations, instructions, or materials contained therein.

PERMISSIONS

Book purchasers may photocopy, print, or e-mail up to five copies of an NSTA book chapter for personal use only; this does not include display or promotional use. Elementary, middle, and high school teachers may reproduce forms, sample documents, and single NSTA book chapters needed for classroom or noncommercial, professional-development use only. E-book buyers may download files to multiple personal devices but are prohibited from posting the files to third-party servers or websites, or from passing files to non-buyers. For additional permission to photocopy or use material electronically from this NSTA Press book, please contact the Copyright Clearance Center (CCC) (www.copyright.com; 978-750-8400). Please access www.nsta.org/permissions for further information about NSTA’s rights and permissions policies.

Library of Congress Cataloging-in-Publication Data

Lowery, Lawrence F., author.
Dark as a shadow / by Lawrence F. Lowery ; illustrated by June Goldsborough.
pages cm -- (I wonder why)
Audience: K to 3.
ISBN 978-1-941316-06-1 -- ISBN 978-1-941316-96-2 (e-book)
1. Light--Juvenile literature. 2. Shades and shadows--Juvenile literature. I. Goldsborough, June, illustrator. II. Title.
QC360.L692 2014
535’.4--dc23

2014019374

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*).

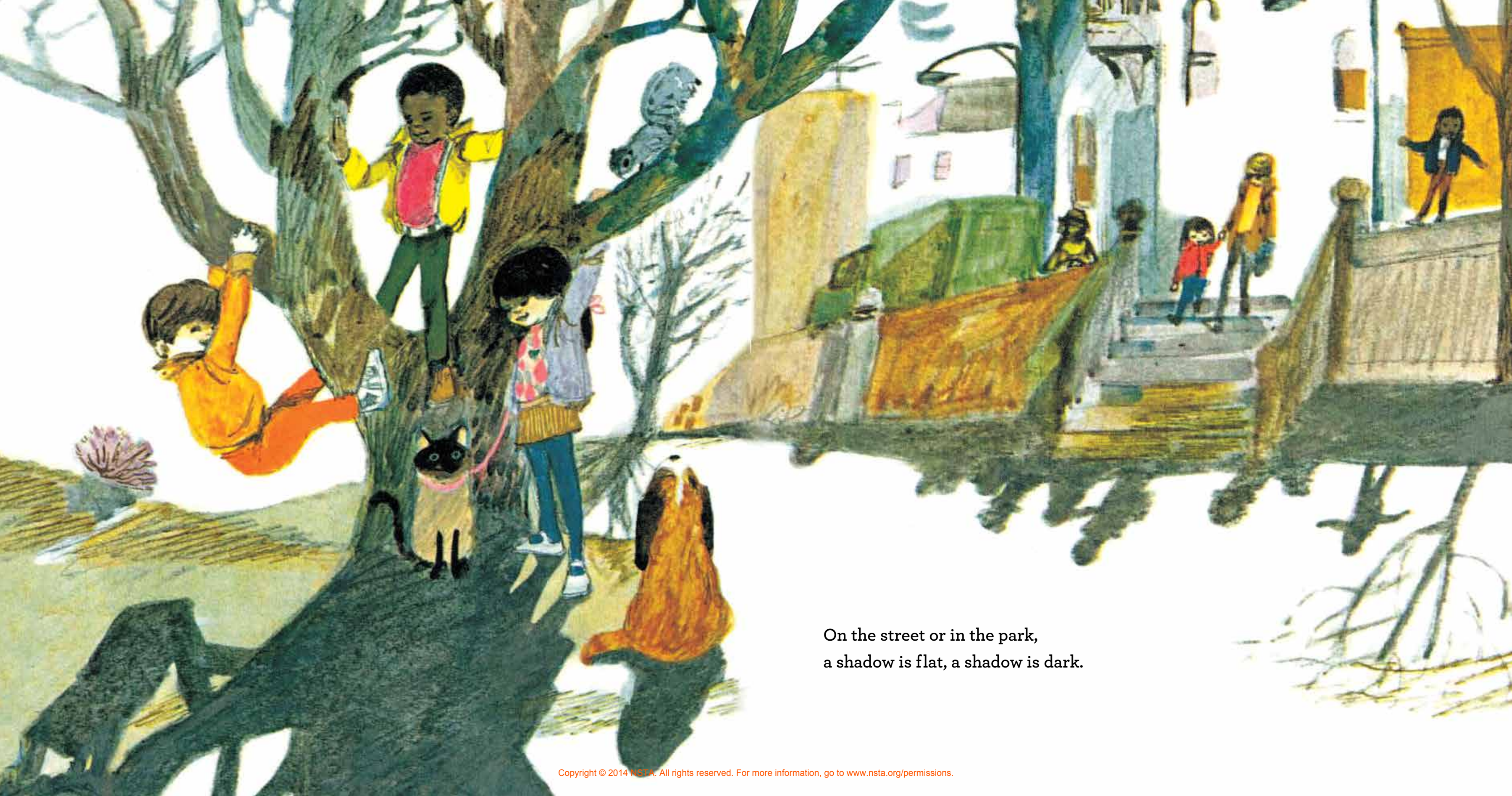
The information in these books leads the characters and the reader to discover how opaque objects block light and cast shadows, that different objects have special and useful properties (glass and rubber), that simple mechanical tools reveal some of the laws of physics, and that “nontouchable items”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



On the street or in the park,
a shadow is flat, a shadow is dark.

When you twist and bend or
wiggle and shake,
what kinds of shadows can you make?



A turning, twisting object
has a shadow that will change.

Don't you think that turning shadows
can be just a little strange?

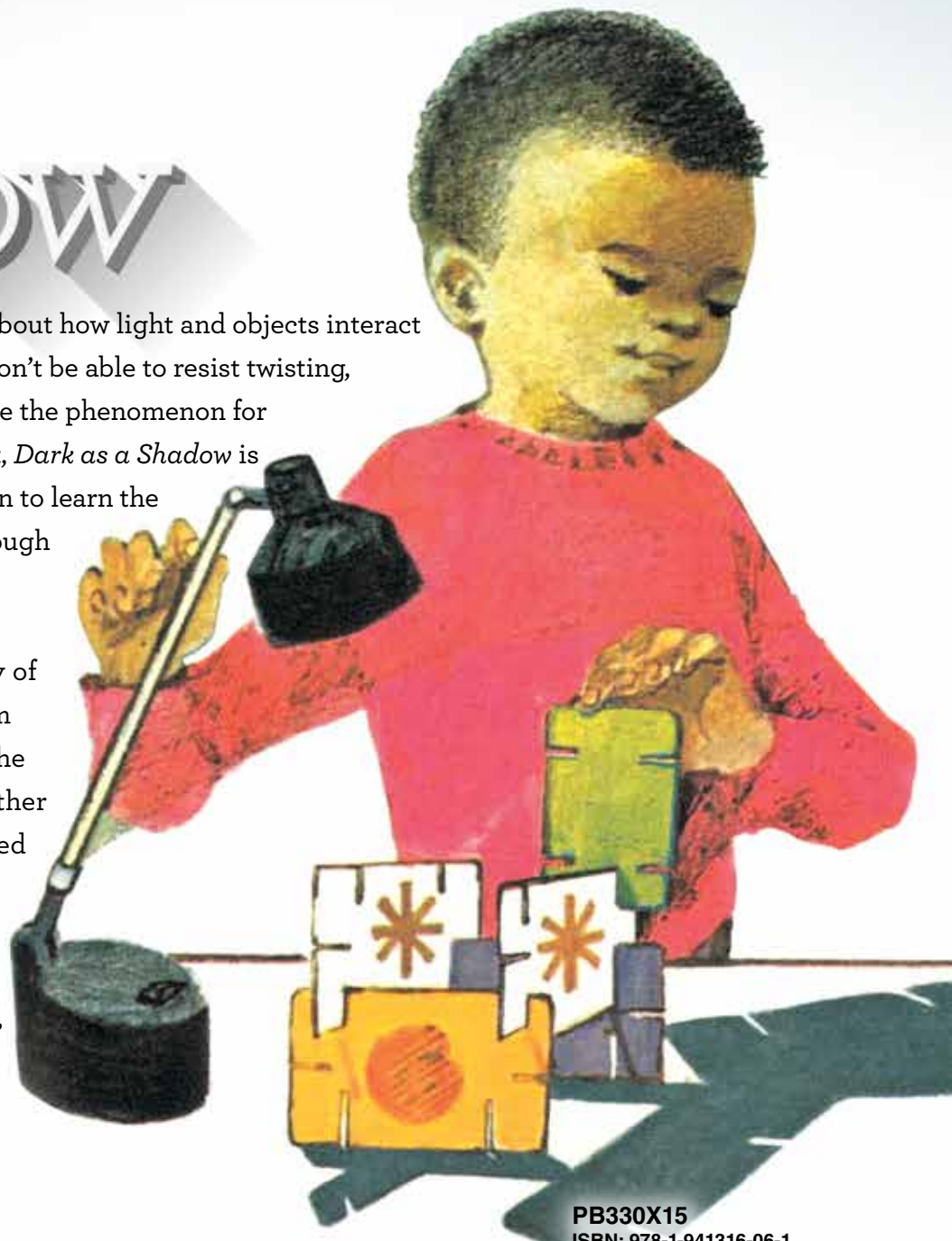




DARK as a SHADOW

Time for shadow play! After reading about how light and objects interact to create shadows, young children won't be able to resist twisting, wiggling, bending, and shaking to see the phenomenon for themselves. To add to the enjoyment, *Dark as a Shadow* is written in lively rhymes, making it even more fun to learn the science behind why shadows change length through the day and disappear in the dark.

Dark as a Shadow 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: 580L

NSTA Kids
National Science Teachers Association

PB330X15

ISBN: 978-1-941316-06-1

